

WESSEX CAVE CLUB

Journal No. 111, Vol. 9.

EDITORIAL

With the publication of the last issue of the Journal by off-set litho, we have probably come to the end of an era. Previously, the Journal has usually been printed by the "slave labour" of members using a rotary duplicator. During the time the Journal has been produced by this method, it has expanded from the two sided circular of pre-War days to the thirty sided journal of recent issues, which the Journal Production Team and the Editor have endeavoured to produce at bi-monthly intervals. As was pointed out at the last A.G.M., the sheer size of producing the Journal was becoming a considerable problem, so the Committee looked into the possibilities of professional production. Since that A.G.M., when the only figures we had available for professional production were too expensive for the Club to afford on the present level of subscriptions, the Committee sought further quotes, and finally obtained one to print the Journal by off-set litho at a price only slightly above that paid previously for duplicated issues. In view of the considerable advantages to be gained from producing the Journal by this method, the Committee decided to go ahead and the last issue (dated February 1967) was the first to be so produced.

In spite of the change in the method of production, all copy for the Journal should still be sent to the Editor at his home address (Yew Court, Pangbourne, Berks. Tel: Pangbourne 2385). If possible, the Editor would prefer to receive articles typed on double (NOT one and a half) vertical spacing, and on one side of quarto sized paper, but as long as he can read the writing he is very happy to receive any article. One of the advantages of the off-set litho process is that it reproduces typescript, surveys, and photographs with equal ease and the last two at very little extra cost, so the Editor hopes that members will take this into consideration when submitting articles in future.

CLUB NEWS

Now that the site works are so nearly complete we look forward to the time when we will be able to go ahead with the proposed building. It has been decided that the name shall be:-

UPPER PITTS
Eastwater Drove,
Priddy,
Nr. Wells,
Somerset.

The name Upper Pitts is the pre-Ordinance Survey name for the field adjacent to the home paddocks of Eastwater Farm where we have our site. This name was recorded by the late A.T. Wicks, Esq., an authority on Mendip field names, as long ago as 1920 before O.S. Plot Numbers came into general usage. There are of course two well known farms to the south called Lower Pitts and Higher Pitts, and it would seem that the name had local significance at the time of the Enclosure on Mendip. Appropriately enough they seem to refer to three isolated mining ventures between Nine Barrow and Ebbor. Ours is the most northerly and most forgotten of the three, though a shallow 'rake' and some 'gruffy' lie immediately to the west, while the pond across the way was most likely associated with the mining; it was once much larger than it is

today.

On Eastern and Western Mendip

1. Stoke Lane Slocker. Members who have visited Stoke Lane in the past few months will be aware that Mr. and Mrs. Stock have left Cooks Farm. They are living in retirement elsewhere in Stoke St. Michael. Not only have they always taken a great interest in the cave, but they never failed to welcome cavers, often laying on hot water and offering shelter. Mr. Stock took an active part in the affairs of the Shepton Mallet Caving Club for a number of years.

In warmly wishing them a long and well earned rest, the Club extends to them very sincere thanks for all their efforts. One always enjoyed visiting the farm just as much as going down the cave which they were, and still are, so justifiably proud to own.

2. Longwood Swallet. We understand that Mr. and Mrs. Young will be retiring shortly and leaving Lower Farm at Charterhouse. Many of us have cause to thank Mr. Young and his family for their hospitality and personal interest in our subterranean pursuits. Like most of Mendips farmers who have caves on their land, Mr. Young knew the Longwood and G.B. systems at first hand, and never failed to enjoy discussing our trips with us.

On behalf of Wessex members it would now seem a fitting opportunity to thank Mr. and Mrs. Young for all their help, and to wish them a long and happy retirement from the rigours of farming.

The outcome of these retirements will not have escaped member's attention. Quite obviously we must make every effort to meet the wishes of the new occupiers, ensuring that the friendship of the farmers and their families is always put before our wish to enter the caves on the land from which they must make a living. In particular members are requested not to use Long Barn for changing for G.B. this summer until further details are known and published.

On Central Mendip

Until recently the attractive Ebbor Gorge and its surrounding woodland was owned by Mrs. O. Hodgkinson of Wookey Hole. While its small caves might not have proved very exciting they are certainly of academic interest, and there are few members who cannot have enjoyed walking or climbing in this delightful part of Mendip. Long may we continue to be so privileged.

The land now belongs to the Nature Conservancy. This is a professional and scientific body not to be confused with the National Trust. We must acknowledge Mrs. Hodgkinson's wisdom and great generosity in seeing fit to make this gesture, so preserving such a classic piece of the Mendip scene for all time. The official opening as a nature preserve will be in mid-May.

As distinct from the National Trust, a nature preserve is not freely open to the general public for the simple reason that it aims to protect its wild life. Access will have to be negotiated. Obviously therefore it must be as widely appreciated as possible that no one must prejudice the Conservancy against the possibility of granting us satisfactory way leave to Ebbor. The present Warden of the Ebbor and Rodney Stoke preserves is:-

A.J. Elliot, Esq.,
East House,
Wookey Hole.

Caving in the North

Members planning private visits to West Yorkshire this summer should take careful note that many of the fells and pot holes have strict access arrangements. Full details are to be found in the following booklet Permission to Explore Northern Caves and Potholes. Price 2/- inc. postage, from the Hon. Sec. The Cave Rescue Organisation, B. Boardman, 29, Norfolk Avenue, Burnley, Lancs. The following revisions to this booklet were received at the beginning of the year:-

1. Leck and Casterton Fells. Permission from Geoff Morgan, 23 Runnington Avenue, Colne, Lancs.
2. Pen-y-Ghent and Fountain Fells, and Mungo Gill. Permission from J. Rasdell, 76 St. Mary's Avenue, Barnalswick, Nr. Colne, Lancs.

In all cases, bookings are required at least one month in advance.

New Members.

We welcome the following new members to the Club. Elected on 29th January 1967:-

M.D.A. Cullimore, 'Beaulieu', Blind Lane, Flackwell Heath, Bucks.
D.W. Hardwick, The Boynings, Altwood Road, Maidenhead, Berks.
M. Stevens, 174, Badminton Road, Downend, Bristol.

Elected on 5th March 1967:-

P.B. Bently, 9 Northover Road, Westbury-on-Trym, Bristol.

Jumble Sale.

A sale will be held as before at the Wells Y.M.C.A., on Saturday, 3rd June 1967. Proceeds to go to the Hut Fund. Our experience of the last two sales show that clothes are the best seller, but not shoes or general haberdashery. The Hon. Secretary will be pleased to hear from any members who have clothes to contribute. It is preferred that all items for sale be brought to Wells in good time before the actual sale commences at 2.45 p.m. though the Secretary is able to store a certain amount in advance. Offers to help at stalls are very welcome if only to tide us over the usual free for all in the first hour. Please give this your utmost support for we now have a reputation for Jumble Sales in Wells which is second to none!

Club Rule 16 and Affiliated Clubs.

Rule 16 states; "That caving clubs or societies attached to educational establishments for minors or youth organizations may become affiliated to the Club on the approval of the Committee and subject to the inclusion in the rules of the club to be affiliated certain rules as approved by the members of the Wessex Cave Club and compliance with regulations as laid down from time to time by the Committee of the Wessex Cave Club for the time being. The subscription shall be one quarter of the subscription of an Ordinary Member of the Wessex Cave Club for each member of the affiliated club. Each affiliated club shall have one vote and receive one copy of each Journal and other Club communications.

NOTE; The concession given by this rule is normally intended for minors under 18 who are not wage earners and who are still pupils at the educational establishments concerned or active members of the affiliated youth organisations. Adults attached to an affiliated club will normally be expected to join as full members'.

The current regulations applicable to the above Rule (see line 4) are as follows:-

All clubs which are affiliated to the Wessex Cave Club (hereinafter referred to as Wessex) under the terms of Rule 16 of the Wessex Club Rules must comply with the following regulations which have been laid down by the Committee of the Wessex.

1. All members of affiliated clubs must comply with:-
 - a) Rule 16 and other rules of Wessex so far as they apply to affiliated clubs.
 - b) The Hut Regulations and the orders of the Hut Warden and Assistant Hut Warden.
 - c) The orders of the Tackle Warden when using Wessex tackle.
 - d) Such sundry regulations or decisions that the Committee may make from time to time.
2. Members of affiliated clubs do not become, and must not represent themselves as, members of Wessex.
3. Each affiliated club shall produce to the Secretary or Assistant Secretary of Wessex a copy of its rules on request.
4. Each affiliated club shall send to the Assistant Secretary of Wessex in October of each year a list of members of the affiliated club, giving names, addresses, and ages, and the same particulars of any new member within one month of election shall be advised to the Assistant Secretary of Wessex.
5. Each affiliated club may have use of Wessex tackle, and Wessex Club accommodation only by advance application to the Hut Warden. No guests of affiliated club members will be allowed these facilities.
6. Each affiliated club shall receive one copy of each Journal and other club communications (see Rule 16). But affiliated clubs may make advance annual orders for additional Journals at a price to be agreed at the time.
7. Members of affiliated clubs shall receive, as far as possible, the same access arrangements to controlled caves as full members of Wessex.'

Lamb Leer.

Recently there has been some confusion concerning the locking of the entrance gate. As the farmer is very insistent that the cave is always securely locked all parties are urged to make sure they have properly locked up before leaving the site. New padlocks have been obtained with interchangeable keys; one is on the gate and the other is held by Mr. Burge.

Should the former prove temperamental and fail to lock correctly then the emergency padlock should be acquired from Mr. Burge. Please send the offending padlock to the Assistant Secretary when you return the keys. He will be able to get the padlock serviceable and replaced. Do not attempt to see to its repair yourself, for in the long run this only confuses the situation, and we shall be back where we started from.

Club Dig at Fairman's Folly

The following programme of digs at the site has been arranged:- April 8th/9th, April 23rd/24th, May 13th/14th, May 27th/29th (Whitsun) June 10th/11th, June 24th/25th, July 8th/9th, July 22nd/23rd. Anyone interested in helping at the dig should contact the Technical Projects Organiser: A.J. Surrall, 216 Evesham Road, Headless Cross, Redditch, Worcs.

CLUB MEETS

Please give the Leader prior notice of your intentions of joining a trip.

Saturday March 18th 2.30pm. Burrington Caves and ladder practice. (beginners welcome).

Leader: Will Edwards, 91 Rookery Road, Knowle, Bristol 4.

Easter March 24th/27th Yorkshire

Leader: Carl Pickstone, 126 Knowles Street, Radcliffe, Nr. Manchester.

Saturday April 1st 2.30pm. Longwood/August

Leader: R. West, Elm Tree Cottage, Hallatrow, Nr. Bristol.

Sunday April 9th 11am. St. Cuthbert's

Leader: Jim Giles, C.P.O's Mess, R.N.A.S. Yeovilton, Yeovil, Somerset.

Weekend April 15th/16th Agen Allwedd

Leader: T .C. Bryant, Glyncoed, Victoria Road, Maesycwmmmer, Hengoed, Glam.

Saturday April 22nd 3.0pm. Eastwater

Leader: Pete Gibbs, 40 Hollywood Road, Brislington, Bristol 4.

Saturday April 29th 2.30 p.m. Swildons (Troubles Round Trip) Nife cells, wet or goon suits considered essential. Leader: T Reynolds, Yew Court, Pangbourne, Berks.

Saturday May 6th 2.30pm. Lamb Leer. Leader: Will Edwards. - see above.

Saturday May 20th 3.00pm Stoke Lane.

Leader: Hugh Pearson, 111 Hampton Court, Pangbourne, Berks.

Whitsun May 27th/28th Derbyshire

Leader: D. Westlake, Tristan Drive, Creech St. Michael, Taunton, Somerset.

Saturday June 3rd 2.30pm. Eastwater Leader: Rich West, see above.

June 3rd/4th Proposed Devon weekend

Leader: Donald Thomson, Pinkacre, Leigh-on-Mendip, Nr. Bath, Somerset.

Saturday June 17th 2.30.p.m. Introduction to Rock Climbing, Avon Gorge.

Leader: Will Edwards - see above.

Saturday June 24th 7.0.p.m. Barbecue Leader: Donald Thomson - see above.

Weekend July 1st/2nd Forest of Dean

Enquiries to: Roy Staynings, 8 Fanshawe Road, Hengrove, Bristol 4.

Saturday July 8th 3.0.p.m. G.B. Cavern Leader: Roy Staynings - see above.

Sunday July 30th 11.0. am. "Follow on" to Introduction to Rock Climbing, Avon Gorge.

Leader: Pete Gibbs - see above.

Weekend August 12th/13th South Wales.

Leader: Oliver Lloyd, Withey House, Withey Close West, Bristol 9.

Weekend August 19th/20th Steep Holm. Leader: Roy Staynings - see above.

Weekend October 7th/8th Derbyshire Leader: Alan Wicks.

Saturday October 21st A.G.M. and Dinner.

1968 Proposed trip to America - anyone interested in a caving/family holiday in America is invited to contact Donald Thomson - see above.

Hon. Secretary: J.D. Hanwell,
"Chaumbey", 50 Wells Road, Wookey Hole, Wells, Somerset.

Hon. Asst. Secretary: R.M. West,
Elm Tree Cottage, Hallatrow, Nr. Bristol.

Hon. Treasurer: Mrs. B.M. Surrall,
216 Evesham Road, Headless Cross, Redditch, Worcs.

Subscriptions Treasurer: G. Moore,
4 Hazelwood Road, Sneyd Park, Bristol 9.

Hut Warden: P.M. Giles,
C.P.O's Mess, R.N.A.S., Yeovilton, Yeovil, Somerset.

Caving Secretary: R.J. Staynings,
8 Fanshawe Road, Hengrove, Bristol 4.
Telephone: Whitchurch 3689.

Hon. Editor: T.E. Reynolds,
Yew Court, Pangbourne, Berks.

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Corrie J. 1961. Civil Engineering reference book. 2 ed. Vol. 2. Butterworth.

Gardner, Howell & Jones. 1927. U.S. Department of Commerce, Bureau of Mines, Bulletin 287. Gases from blasting in tunnels and metal mine drifts.

Williams and Williams. 1963. The transactions of the cave research Group. Vol. 6. No. 2. Hazards of using explosives.

Little and Thomas. 1955. The transactions of the Cave Research Group. Vol. 4 No. 1. Explosives as an aid to Cave Exploration.

I.C.I. 1961. Blasting in quarries.

I.C.I. 1965. Electric shot firing.

I.C.I. 1965. Explosives in agriculture.

SURVEY SCHEME

The following surveys are available at the prices listed;

Mendip Caves

Balch Cave - Plan	3s.	9d.
Balch Cave – cross sections	3s.	9d.
Brownes Hole	2s.	0d.
Caves of Cheddar Gorge	4s.	3d.
Coopers Hole	3s.	3d.
Eastwater Swallet (two sheets)	8s.	3d.
G.B. Cavern	3s.	6d.
Goatchurch Cavern	2s.	6d.
Holwell Cave	2s.	6d.
Lamb Leer Cavern	3s.	9d.
Longwood/August – sheet 1	5s.	6d.
Longwood/August – sheet 2	3s.	3d.
Longwood/August – sheet 3	3s.	6d.
Pine Tree Pot	2s.	6d.
Quaking House Cave	2s.	6d.
St. Cuthbert's Swallet – plan	3s.	3d.
St. Cuthbert's Swallet – section	2s.	6d.
St. Cuthbert's Swallet – addendum	1s.	0d.
Stoke Lane Slocker	4s.	3d.
Swildons Hole	4s.	3d.
Ubley Hill Pot	2s.	3d.

Northern Caves

Pate Hole, Nr. Appleby, Westmorland	2s.	3d.
Threaplans Cave, Cracoe, Yorks	3s.	6d.
Washfold Pot, Selside, Yorks	3s.	6d.
Yordas Cave, Kingsdale, Yorks	2s.	6d.

Notes: Longwood/August Survey

Sheet 1: Plan of the complete known system with a projected elevation. Scale 1 cm. to 10 ft. Also shows relationship of cave to the surface.

Sheet 2: Plan of upper series only. Scale 1 in. to 10 ft.

Sheet 3: True length elevation of complete cave with cross sections. Scale 1 cm. to 10 ft.

Swildons Hole Survey

This is the 4th edition (published May 1965) of the survey by W.I. Stanton, and shows the streamway as far as Sump 12 and includes Shatter Chamber.

G.B. Cavern Survey

This consists of the U.B.S.S. proceedings Vol. 6, No. 2, complete with a pull out copy of the survey.

In addition, the following publications are also available:-

W.C.C. Volume One reprint (Spring 1964)

price 7s. 6d

This is a reprint of all of the Club's publications from the first Circular issued (October 1934) to Circular No. 25 N.S. (November 1950).

W.C.C. Volume Eight Supplement (October 1964)

price 6s. 0d

This is a reprint of the Club log books which are kept at the Club H.Q. at Hillgrove. The reprint is of the log books for the period from the 26th June 1954 to the 7th October 1963 and contains previously unpublished information of the original exploration of many of the major Mendip Cave systems, including: Swildons, Eastwater, and Wookey.

W.C.C. Journal back numbers

price 2s. 6d each

Back numbers of the following issues of the Journal are available

Vol 6, No.s 78 (Feb 1961), 79 (Apr 1961), 80 (Jun 1961), 82 (Dec 1961).

Vol 7, No.s 84 (May 1962), 88 (Feb 1963), 92 (Nov 1963).

Vol 8, No.s 93 (Jan 1964), 94 (Mar 1964), 95 (May 1964), 97 (Sep 1964), 98 (Nov 1964), 99 (Jan 1965), 102 (Jul 1965), 103 (Oct 1965).

Vol 9, No.s 105 (Mar 1966) to date.

U.B.S.S. Proc. Vol 6, No. 1 (1946-48)

price 3s. 6d

August Hole (with survey); fauna list of Mendip Caves; earth, resistance measurements; Burrington Combe survey; indicator of water flow; geology of Rod's Pot.

U.B.S.S. Proc. Vol 6, No. 2 (1949/50)

price 3s. 6d

In addition to the G.B. survey (see survey scheme price list), this publication contains: bat ringing scheme; earth electrical measurements; Rhino Rift.

The prices given above do NOT include postage and packing. To cover this, the following charges apply for both surveys and publications:-

1 survey	1s. 0d.	5-6 surveys	2s. 6d.
2 surveys	1s. 6d.	7-10 surveys	3s. 0d.
3-4 surveys	2s. 0d.	Over 10 surveys	3s. 6d.

The surveys are sent folded in an envelope. Persons preferring to receive them rolled should send a tube plus an extra 1/- to cover additional postage, with their order.

Surveys and publications are obtainable from:-

T. E. REYNOLDS, YEW COURT, PANGBOURNE, BERKS.

Cash with orders please. Cheques and P.O.'s payable to "T.E. Reynolds".

WATERPROOF ZIP FASTENERS

H.A. Pearson

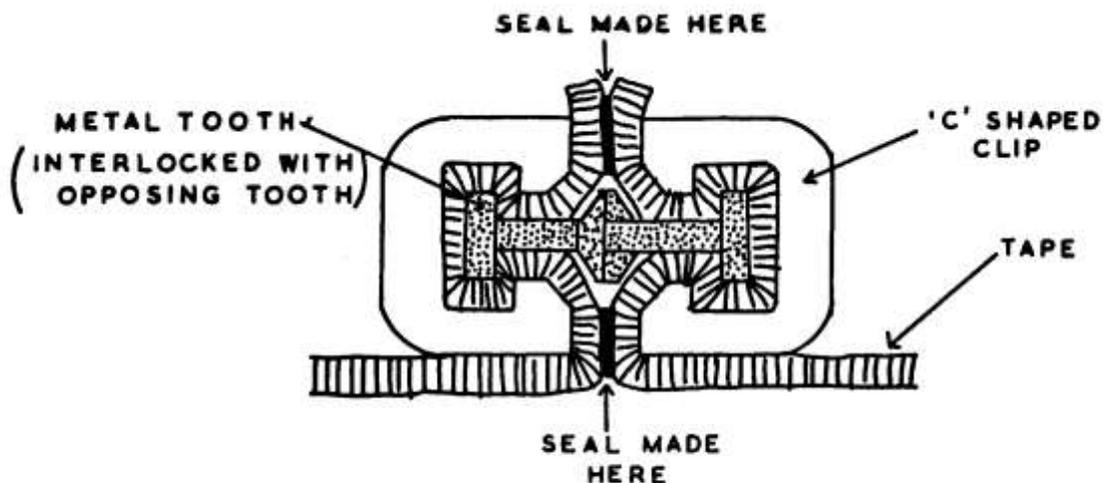
The recent appearance on the Government Surplus Market of 'goon suits' fitted with waterproof zip fasteners has prompted the author to make some enquiries about this remarkable addition to an otherwise classical piece of caving attire. In this article I propose to deal specifically with the type of fastener fitted to the suits mentioned above, and I wish to thank the sole manufacturers of this ingenious device, the New Zipper Co. Ltd., of Slough, for their valuable assistance in this matter.

The BDM Pressure Tight Zip Fastener

In each half of the zip there are three main components:-

1. A length of rubber proofed tape which supports the metal elements of the zip.
2. A number of metal teeth.
3. An equivalent number of 'C' shaped metal clips which hold these teeth in position.

The metal teeth are spaced a set distance apart in a fold along the length of the tape. Each tooth is held in place by an individual 'C' shaped clip on the outside of the fold. When the two sides of the zip are brought together by means of the slider, the teeth interlock and by so doing compress the tape surfaces between the opposing 'C' shaped clips, thus forming a seal. The accompanying diagram shows a cross-section of the zip in its closed condition, the solid black areas indicating the points at which the seal is made.



CROSS SECTION OF BDM ZIP FASTENER

Very cunning, but how effective is it? The specification of the zip fitted to the goon suits in question speaks for itself. The closed fastener (Medium Weight - Size No. 8) will fully retain a pressure of 10 psi, whilst it has a lateral strength of just over 100 lbs. per inch length. Normal degrees of flexing, bending, and lateral pressure on the sides of the zip do not affect its performance - it will remain 100% air/water/light tight. The BDM fastener is available in three basic forms:-

1. Both ends closed and fully sealed.
2. One end open (type fitted to goon suits).
3. Both ends open and fully separable.

In addition, each of the above types are made in three 'weights' - light, medium, and heavy. The manufacturers will gladly advise on the most suitable type for any particular application.

Replacing Sliders and End Stops on BDM Zip Fasteners

As purchasers of these new goon suits will know, the zip fitted to each suit has been rendered inoperative by the removal of the slider. Apparently this was done in order to ensure that the suits were sold as imperfect on the Surplus Market. The "do-it-yourself" types have had varying degrees of success with homemade sliders - some claim the zip to be 'as good as new', whilst others confess to ruining it completely.

However, for those who haven't yet attempted their own repairs, the manufacturers of the zip fastener are able to supply a new slider and end stops at 7s 6d per set (post free). They do stress, however, that "do-it-yourself" repairs are only possible if the zip is still in a closed condition, since the slider can only be fitted in this state. Closing the zip by hand requires considerable patience, and attempts to do so may result in damaging it beyond repair, unless great care is taken. The main problem is that the teeth **MUST NOT** be forced together, by using a pair of pliers for instance. The teeth **MUST** be interlocked gradually by bringing the two sides of the zip into contact with each other at an angle of approximately 25 degrees to the centre line of the closed portion of the zip. Also any attempt to close the zip by hand must be made from the closed end in order to ensure that the correct teeth interlock with each other. If you start from the open end you are liable to find several teeth left over when you reach the bottom ! The manufacturers recommend the following method of attaching the new slider to a **CLOSED** zip. Push the zip into the parallel portion of the slider until resistance is felt, and then part the two halves into the divergent channels of the slider. It will then be possible to open the fastener in the normal way and attach the end stops using a pair of pliers.

If the zip has been opened without the use of a slider, the manufacturers advise that the suit be returned to them for repair, for which a charge of 15s 00., plus 9s 0d postage and packing will be made. Requests for further information, orders for new sliders and end stops or complete suits requiring zip repairs only, should be sent direct to the following address, together with the appropriate remittance and a covering letter stating that the sender is a Club Member.

The New Zipper Co. Ltd., Buckingham.Avenue., Trading Estate, Slough, Buck.

MENDIP NOTES

by

Cheramodytes

Spore Testing on Mendip

This great water tracing experiment, directed by David Drew and begun on New Year's Day, 1967, received a preliminary report in the last issue of the Journal. I now have further details from David.

The only resurgences which received spores were the Cheddar and Wookey Hole risings. All others were negative. Manor Farm and August Hole each took 20 hours to reach the Cheddar risings (1st and 2nd Feeders). Swildon's Hole took 25 hours to reach Wookey Hole, Eastwater took 16, while St. Cuthberts took only 11 hours to reach this rising. These results are quite certain. The negatives are highly significant, in view of the high flow conditions occurring. It is most unlikely that connections occur with any other risings.

David has analysed frequency curves, flow and rainfall data and has come up with the following conclusions:

Cheddar. Manor Farm and August Hole join early on, after which there is a very long phreatic or canal zone to the rising. August Hole is relatively open and clear all the way. Manor Farm is subject to heavy blockages before its junction with August Hole.

Wookey Hole. Eastwater and St. Cuthbert's may join shortly before Wookey. St. Cuthbert's is a very open vadose passage for 1 to 1½ miles. Eastwater has very heavy blockages and constrictions. Swildon's is fairly open, takes a separate route to Wookey and is "very aqueous!" The upstream sump in Wookey Hole probably extends for only a short distance beyond the known parts, before reaching open cave.

St. Cuthbert's Sump.

The evidence provided by spore tracing of a rapid flow between St. Cuthbert's and Wookey Hole, mainly above water, has stimulated a fresh attack on the sump at the end of St. Cuthbert's. The last digging attack by cave divers was in the summer of 1963, when Mike Thompson and John Cornwell, using breathing apparatus, penetrated about 14 ft. over a period of some weeks. The recent attack was a concentrated one, because it was hoped to stop the water by damming the stream for a short period. The week-end of February 4th, 1967 was chosen and a round-the-clock rota of diggers, divers, and supporters was arranged, drawn from many clubs. This side of the organization, which was mainly done by the B.E.C. went very well. So also did the arrangements for providing diving gear and plenty of air, which was done by members of the Cave Diving Group, Somerset Section. Two things, however, went wrong. First it was very wet and nothing would hold up the water. Underwater digging was difficult and the spoil could not be brought back for disposal. Second, the Hunter's Lodge Inn opened as usual on Saturday evening, and this finalized the collapse of the project, after 10 ft. of sump had been dug out., Now Phil Kingston and Barry Lane are quietly getting on with the job on favourable week ends and are making fairly good progress.

Beyond Bridge Cave

The event of the year has been the discovery of the master cave for the Little Neath Valley by divers on 22.1.67. This was not just an accidental discovery, for teams of U.B.S.S. divers had been pushing every sump they could find in South Wales that had not already been pushed, for weeks past. At Bridge Cave they hit the jackpot. Chris Gilmore was the first man through, but it was not until 28.1.67, that they realized how important their discovery had been. A party of four led by Dave Savage all went through the sump on that day and found some mile and a half of cave passage, much of it bigger than Ogof Ffynnon Ddu. They also discovered a small upstream entrance (too small, alas, for your Scribe) at river level. This made it possible on subsequent occasions for surveyors who were not divers to get to work in the cave. But it gave them an unpleasant surprise when the river rose.

Two recent cases of cavers being trapped by water at cave entrances has made this subject topical. It has usually been assumed that if you can get in you can get out, provided the flow remains the same. This is not so. One caver, with whom I am particularly well acquainted, tried it at Stoke Lane, on 28.1.67, when the water was high. There was a fair sized air space and it was uncomfortable easy to get in: the water pressure was too helpful. Getting out proved impossible without breathing apparatus, since the opening is tight and the air space disappeared when obstructed by a body.

I'm not sure what the position would be at Swildon's. I know it is possible to get in and out when the water is over the grating. Here it is much easier than at Stoke Lane, because it is not tight and can be done with the breath held, provided the weight of water is not too great.

The other case involved three cavers who were busy surveying in the Little Neath Master Cave on 18.2.67, while the river outside was rising unexpectedly quickly. The new entrance to this cave takes very little, if any, water from the river in normal times, but on this day the river rose a foot and a half and flooded this entrance.

In both cases the subjects had the problem of waiting around while wet and cold. At Stoke Lane the delay was about 4 hours and at Little Neath about 2½. The wearing of wet suits has completely altered the outlook of this predicament. All were protected in this way. One gets cold, one shivers, but in the time taken one suffers no harm. At Stoke Lane my friend wriggled up into a little tube out of the water, where he could hear what was going on outside,, Heat loss towards the wet rock beneath him was appreciable. At Little Neath the cavers huddled together to prevent heat loss. In neither case were any notable ill effects experienced. It is interesting to observe, however, that shivering takes it out of you almost as much as hard caving. So if you have the choice, choose the latter.

Cuckoo Cleaves.

On 26.12.1966 a considerable fall of boulders and rubble took place at the foot of the shaft while a party was down the cave. M.R.O. was alerted and Garth Dell went down the cave to warn the party of the danger. It is understood that they were very grateful for the information, when they came out and saw what happened. Inspection by Tony Dingle on 1.1.1967 showed that the lower part of the shaft was in a dangerous state. He and others propose to repair the place by inserting stone and concrete in the near future. I have not had a progress report. Caving parties are

advised to inspect carefully the N.W. corner of the shaft just below the concrete pipes and to regard the shaft as dangerous, if there is no sign of repairs having been done. This corner of the shaft has always given trouble, as it becomes loose whenever there is really heavy rain. Falls here have closed the cave on at least four occasions.

Stanley Stock and Cook's Farm

Stanley Stock and his wife have been good friends to all cavers visiting Stoke Lane Slocker for the past 30 years or so, and it is appropriate to record our gratitude to them, now that they have sold the house and gone into retirement. Stanley was at one time Hon. President of the Shepton Mallet C.C., and his wife used to be active in the local Women's Institute, and once inveigled me to go along there and give an illustrated talk about caving. The house at Cook's Farm now belongs to Mr. and Mrs. Sims, a young and friendly couple who are not, however, farmers. The cave still belongs to Mr. Stock, together with most of the land. Cavers are not charged a shilling and are allowed to change in the calve's lodge behind the barn, but are asked not to park their cars in the farm yard. Cavers wishing to change in the premises should call and ask permission.

Swildons VII

Dave Savage has quite a promising dig at the far end of the upper part of Swildon's VII. Here there is a steeply descending passage. With other cave divers he was working there on 10.12.1966 and again on 14.1.1967. The prospects are good, as it is likely to connect up with Shatter Series.

Swildon's Twelve-and-a-half?

On Monday 27.2.1967 after a considerable amount of preparation, Mike Boon nearly reached an airspace in Sump XII in Swildon's Hole. According to my informant, Mike Jeanmaire, who was on the party with him, he went through a tight underwater squeeze and observed an air space some distance above him. He was however unable to surface, as his valve began leaking. He returned none too soon, after 20 minutes, for he only had 15 ats. left in his bottle. He was supported by a diving party from the Happy Wanderers, three of whom accompanied him most of the way. The trip lasted 14 hours and from Mike's account must have been a rare, old shambles, though this is not his view. Of the 7 or 8 divers in the party more than half suffered some form of demand valve trouble. This affected the Scubas and Snarks but not the two Malibus. John Southworth, who is an excellent diver, nearly lost his life in Sump XI, because his valve stopped working while he was towing some luggage through. It is a short but awkward sump and when he gave the alarm signal he had a diver coming in at each end to help him, so that he had much ado to get past them and out into XI again. With so many valves out of order they had to ferry luggage through all the sumps. Sump IX is rather a long one and their line got stuck in it, so that there is now a tangle of line in that sump, which is a menace. By the time they had got back to Sump II they had hardly any air left between them. They emerged at 4 a.m. on Tuesday morning.

On enquiring from Dave Savage, he tells me he is pretty sure that he knows the air space mentioned in this account. He and Dave Drew instead of diving down to the limit of the sump on one occasion turned right through a tight squeeze. This leads to a tight vertical rift up to the air space mentioned. If this is so, then Mike Boon didn't get quite as far as they did.

EXPLOSIVES AND CAVE DIGS

A.J. Surrall

There is nothing more frustrating with a dig, be it on the surface or in the far reaches of a large system, than to find a huge boulder in a short length of constricted passage, barring the obvious route. The manual removal of these obstacles in the normally limited space available can be extremely tedious and laborious, and from its sheer magnitude can quite easily deter further activity. However, in more recent years, chemical muscles (explosives) have come to the digger's aid, and it is now possible in one short trip to produce an effect that in the past would have required many curse-laden hours and possibly several trips.

But before proceeding with a description of types and uses of explosives, just a few words on the legal position. To purchase and store explosives a police certificate must be obtained, and for the purpose that we are considering; this will be an 'explosives for private use, form C', and is issued by the chief constable of the district in which the materials are to be stored, after he has satisfied himself that the intended use is reasonable and that the person applying is fit to hold the certificate. Once issued it needs to be renewed annually and must be produced whenever a purchase is made. The private use certificate permits the holder to purchase 10 lb of explosive and 100 detonators, any number of times during its life, but the amounts stored must not exceed the amount stated.

To be of commercial value, an explosive must fulfil certain requirements and these to a considerable extent are determined by the job to be done. If we consider two typical applications this will become clear.

- | | |
|----------------------|---|
| (1) Coal Mining | Safety in handling and storage.
Economics; work done per charge.
Minimum flames when fired.
Production of minimum amount of toxic fumes.
Must produce a push rather than a shattering effect. |
| (2) Military weapons | Safety in handling and storage.
Maximum blast and shattering effect.
Flames and fumes unimportant.
Cost relatively unimportant.
Preferably prepared from indigenous raw materials. |

From the above requirements it can be seen that explosives need to be tailored to a specific job, and this in fact is possible and many categories exist for various purposes. If we think of cave digs, we can see that something approaching a mining explosive is needed. Ideally it would need to have something like the following list of properties:-

- Safety in handling and storage.
- Low cost.
- No toxic fumes when fired.
- Slightly faster than a quarrying explosive, to crack rocks with a small charge.
- Waterproof.
- Must be plastic, mouldable.

The explosive covering all these requirements is not available, so one is chosen from those that are

available and is nearest in its properties. Polar Ammonium Gelignite comes closest, but has a number of disadvantages, although these, with care can be circumnavigated, and will be mentioned later.

The various properties are obtained by blending explosives of differing primary qualities, or with inert materials. The basic chemicals used to produce the bulk commercial substances are few in number, and have general characteristics as follows:-

Nitro-glycerine.

Straw coloured liquid, extremely sensitive to shock.

Nitro-cellulose.

White, fibrous, will not detonate if ignited.

T.N.T. (Tri-nitro-toluene)

Buff waxy mass, very insensitive to heat and shock.

R.D.X. (Cyclonite) Hexamethylene-tri-nitramine.

Similar to T.N.T.

P.E.T.N. (Penterythritol-tetra-nitrate)

Cream powdery substance, fairly sensitive.

Ammonium nitrate.

White hygroscopic crystals, generally stable.

From these basic explosives the commercial mixtures are made. Two examples illustrate this:-

Blasting gelatine

Nitro-glycerine	90-92%
Nitro-cellulose	10-8%

Polar ammonium gelignite. Approx.

Nitro-glycerine	40%
Ammonium nitrate	50%
Wood flour	10%

Submarine blasting gelatine is the most powerful commercial explosive made, whilst Polar ammon gelignite is a general purpose compound with good thrust and low cost. It is produced by the Nobel Division of I.C.I. and is marketed in the form of cartridges $\frac{7}{8}$ " and $\frac{1}{4}$ " in diameter. The smaller ones are about 4" long and weigh around 1½ozs. Polar ammon gelignite is the most popular explosive with Mendip cave diggers, therefore a few words about it might be of interest.

Polar ammonium gelignite

Nitro-glycerine is the main ingredient of a large number of commercial high explosives, but being very sensitive to shock and crystallization at low temperatures in its natural state, needs to be rendered more handable. This can be achieved by absorbing it into a suitable material, e.g. wood, flour, or kieselghur. This principle was first used by Alfred Nobel when he patented Dynamite in 1867; to prepare this he used kieselghur as the absorbent. Now straight nitro glycerine is very fast, too fast for a general purpose explosive, so it is diluted with ammonium nitrate, a normally harmless stable chemical, which, given the right conditions is one that is capable of exploding with medium velocity and high power; and of course, one that reduced the cost per unit, because it is very much cheaper than nitroglycerine. Those who have studied chemistry will at once realise that ammonium

nitrate is hygroscopic i.e. will absorb moisture from the atmosphere surrounding it. When ammonium gelignites are said to 'sweat' they are in fact wet with absorbed water. This in itself is not dangerous but nitroglycerine can be displaced from the inert absorbent, and this of course is dangerous; so it is obvious that good storage conditions are needed. Dry with good ventilation and preferably avoidance of temperature extremes, and with the cartridges packed in moisture proof containers. Outside storage buildings are called magazines and are subject to stringent regulations.

Detonators

What remains to be done now is to use the explosives and the first requirement is to explode them in the right place at the right time. The detonators used to initiate explosives can be activated by a safety fuse or by electricity. The construction of such devices is shown in fig.1 a, b and c, and they function by converting a flash into a detonation wave of sufficient power to set off the main charge. This is accomplished in two stages; the layer A in fig. 1, is sensitive to flame and once ignited is powerful enough to cause the less sensitive but more powerful main charge "B" to explode. The power is now sufficient to cause the bulk explosive to fire. The standard strength 6 electrical detonator is by far the most widely used, and is powerful enough to set off commercial explosives, a No. 6. "STAR" detonator has a resistance of approximately 1½ to 3 ohm and requires about 1/2 an amp for activation. To use it, it is merely necessary to make a hole with a wooden former in the charge and to insert the detonator, but this is almost the last operation when shot firing.

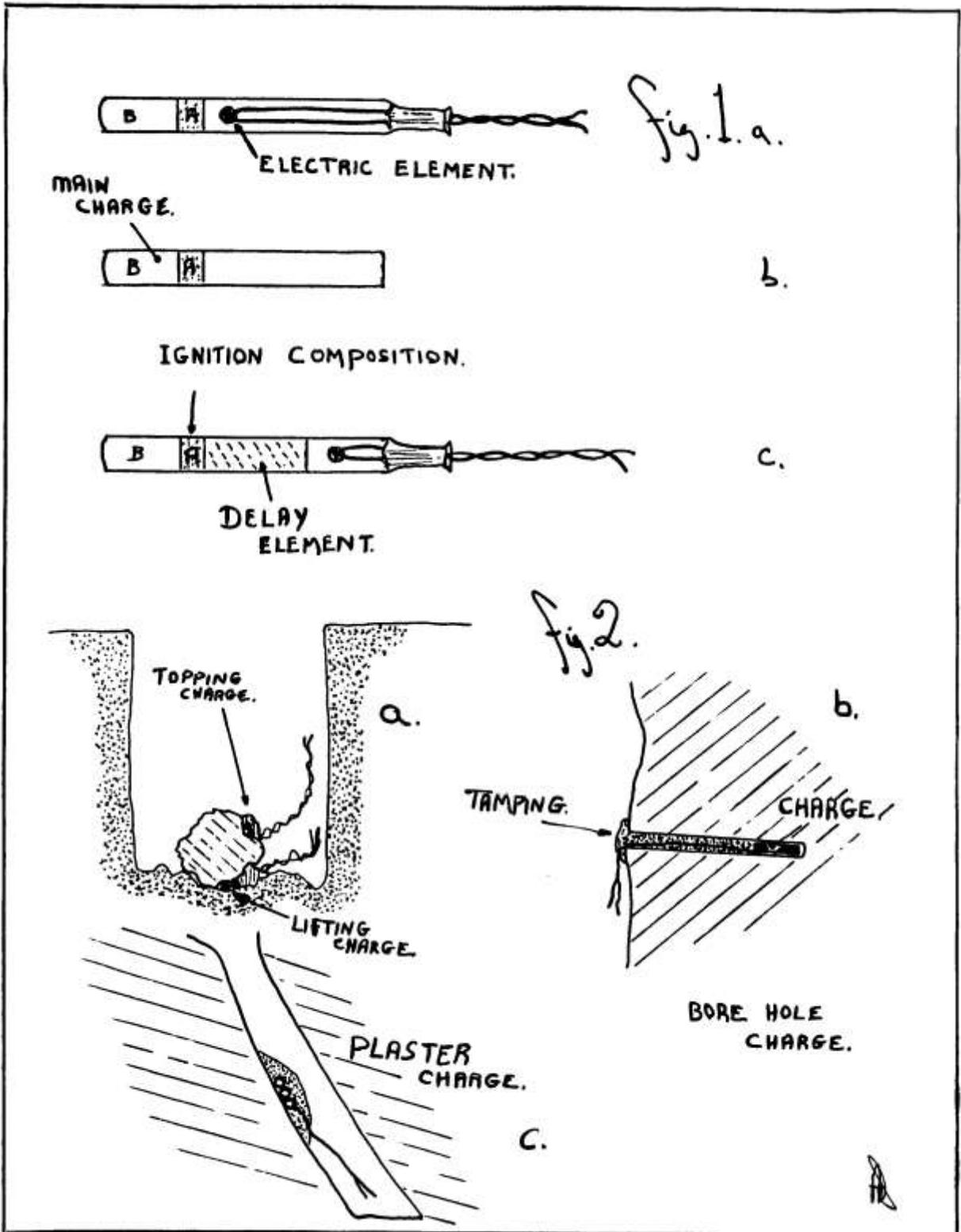
Laying the charge

When it has been decided to use explosives, each step needs to be considered, though certain basic rules apply in all cases. Fig 2 shows three ways of using explosives and almost all situations can be covered by variations of these. The most important basic rule is efficient tamping. This can be anything from firm mud to sand bags or plastic bags filled with clay and it is used to confine the open face of the charge or shot during the first few micro seconds, and greatly enhances the effect. It is at its maximum usefulness in a shot hole drilled in rock, fig 2 a shows two methods of tackling a boulder. To help to keep the charge as small as practical and avoid damage to the surroundings, the charge should be placed on a natural crack or mineral vein or in a cavity, in certain cases a small shot hole and a very small charge are adequate. When cracking a large boulder in a shaft, it must be remembered that lots of fragments can fly about, so it is sometimes better to use a topping shot, than a lifting charge, although the latter would be more useful in lifting a boulder out of a mud layer.

Fig 2 b shows a typical bore hole charge used when a large amount of work is to be done and there is room to wield the necessary hammers and drills, fig 2 c shows a typical plaster charge, applied in a narrow rift, though in this sort of case Blasting Gelatine would be more appropriate than Polar Ammon gelignite due to its higher power.

Firing the charge

Having laid the charge and fitted the detonator it can now be connected to the firing cable, having checked that the far end is guarded and disconnected from ANY apparatus. The cable should preferably be a multi copper conductor, single insulation is adequate for normal cave work since a break is easier to trace than with double insulated types, but availability has a considerable influence here.



The actual firing position must be carefully selected. Underground; at least one right angle away from the charge - preferably two, or in a long passage; in a chamber behind massive boulders; but always at as great a distance as is practical. Be careful also to examine the roof for loose material. Acetylene lamps will almost certainly be extinguished by the shock wave, so electricians or a means of relighting acetylene lamps are essential.

The electrical detonators are fired by devices called exploders, which are of several types: - Battery, Magneto or Condenser, of which only the magneto type is intrinsically safe, in that no electrical energy is stored or is available until it is operated. In all cases the firer must retain in his possession, either the exploder or the safety key until the charge is laid, primed and the firing cable connected. If electrical storms are in the vicinity work with electrical detonators should be suspended, since cables can pick up sufficient charge to fire the detonators, the close proximity of a radio transmitting station can also produce this effect, as can sand storms, though the latter are unlikely to affect Mendip cavers. When all persons are safely behind cover, it is then, and only then, that the exploder is connected to the cable and unlocked. If it is fitted with a galvanometer and high resistance circuit, then the electrical continuity of the shot can be checked. After testing, and when the shot firer is satisfied that all safety precautions have been observed, the shot can be fired.

After firing, the gaseous products must be allowed to disperse AS THESE CAN BE DANGEROUS, since moderate amounts of Carbon Monoxide and possibly variable quantities of the oxides of nitrogen are released and both these gases are poisonous, (see final paragraphs). A loose charge or a badly tamped one will produce more toxic fumes than one laid correctly.

Misfires

The most dangerous situation of all is a misfire. There are many possible causes of this, e.g. detonator slipped out of the charge, broken electrical leads, insufficient firing current, faulty detonator, or an air gap between cartridges comprising the charge. In the event of a misfire, when using electrical detonators at least 10 minutes must elapse before the charge is examined. The charge itself must, under no circumstances be moved.

In order to determine the cause of the failure it is usual to check the firing circuit first, this is done from the firing point with an ohmmeter or the high resistance circuit of the exploder, if an electrical fault is found steps can be taken to correct it and a second attempt to fire the charge made. If this is unsuccessful the firing cables should be disconnected and the charge inspected; with plaster shots the tamping material can be removed gently and a fresh detonator and charge laid against the first, this can then be fired in the normal manner thereby destroying the misfire. The case of bore hole shots is a little more difficult, the stemming or tamping can be washed out with water or compressed air and a fresh priming charge inserted, or if non percussion drilling equipment is available a second and parallel bore hole can be driven a few feet away and a second charge placed.

In cases where it is suspected that the charge has not fired completely a search must be made for unexploded material, if any is found it should be moved to a suitable place and destroyed with a fresh charge. Avoid any more moving than is necessary. All the above operations should be carried out by the shot firer only and not until he is satisfied that all is well should working be resumed.

Blasting accessories

The two items likely to be of use to cavers are:-

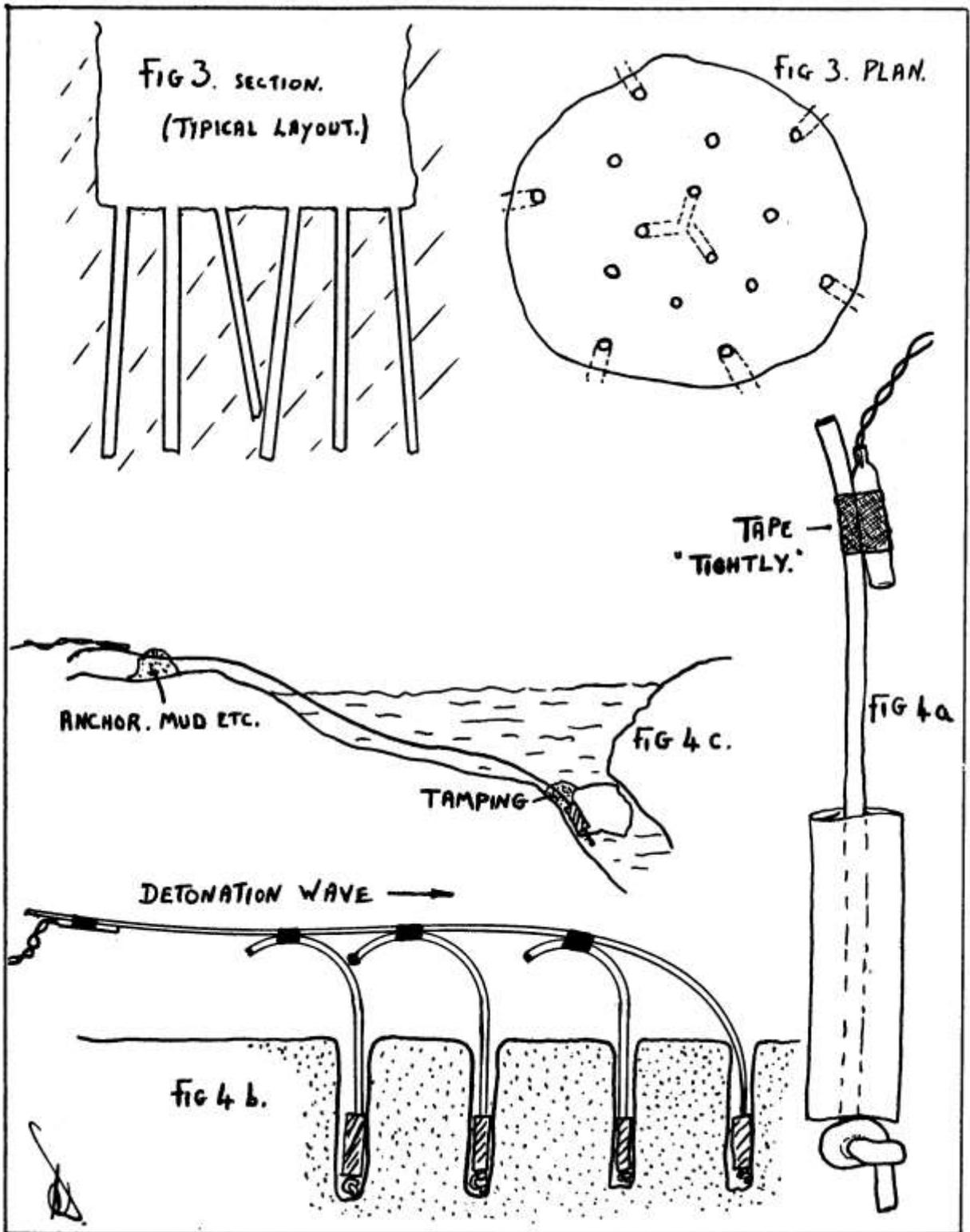
- a) Delay detonators
 - b) "Cordtex" Detonating fuse.
- a) The delay detonator is merely an electric detonator which incorporates a delay element, see Fig. 1c. The delay element is a short metal tube filled with a fairly fast burning gasless mixture. When they were first introduced in 1930 a mixture of Antimony and Potassium permanganate was used and delays of up to 10 seconds were available. Developments since then have produced the short delay series - where the delay composition is more typically elemental Silicon and Red lead, and delays in the micro second range have been added. Commercially available delay detonators range from 25 milliseconds to some 6 seconds, this being done in two series.
- I. Delay detonators half second, (a range of twelve with nominally 1/2 second intervals).
 - II. Short delay detonators. (a range of fifteen with varying millisecond intervals).
- In all other respects the delay detonator is the same as the standard electric.
- b) "Cordtex" detonating fuse looks like plastic clothes line, and is in fact a plastic coated fabric tube which has been filled with high explosive. It is approximately 0.2 inches in diameter and is filled with pentythritol tetranitrate. The velocity of detonation is some 6,500 metres per second. It is extremely safe to handle and does not deteriorate as does gelignite and can be kept in reasonable conditions for several years. It is of course waterproof which makes it ideal for underwater work. Fig. 4 shows the method of use. The important point to bear in mind is that intimate contact between the Cordtex and the detonator and the Cordtex and the main charge is essential, and all joints must be taped or wired.

Using Delay Detonators and Cordtex

The principle use of these items is in multiple shot firing which is used when a large amount of work is to be done, and from the cavers' point of view this would be either: shaft sinking, water diversion channel work, smashing several boulders at once, or the firing of underwater charges.

Delay detonators

Shaft sinking. Fig 3 shows diagrammatically the method used. The shot holes are drilled to a suitable depth and are then charged. The centre hole is sometimes left empty and serves as a cavity for the other charges to blast into, and sometimes a charge is put in with a normal detonator.



The shot holes are charged, and the centre one has a standard or instantaneous detonator, the first ring has delay detonators of a certain delay and the second ring, delays of a longer period. The operation is as follows: The centre fires first and is moving before the first delays operate, these charges now have one free side to blast into and are therefore more efficient; the second ring works in the same manner. This is a very useful method of working through solid rock, but of course one has first to drill the shot holes.

Cordtex

1. Diversion channels. If a channel or a trench is needed then multiple shots linked with Cordtex saves the bother of lots of electrical cable and the consequently high firing energy. For example, for series shots 1.5 amps is the recommended current, and to arrive at the firing energy use is made of ohms law:

Cable, 100 yds. (there and back)	5 ohms
10 detonators and leads, approx. 2 ohms each	<u>20</u> ohms
Total circuit resistance	25 ohms

$I = 1.5$ amp. $R = 25$ ohm. $V = RI$ or 37.5 volts, plus 100% for safety = 75 volts, which is something the normal caver does not have handy. Cordtex is therefore the answer and Fig 4 b shows various joints that can be made with it. But remember that the links must run in the direction of travel of the detonation wave, and NEVER against it. The need for tight joints is again emphasised.

Note: Commercially, when ditches are excavated with explosives, fairly large charges are used and with close spacing only one detonator is used, the shock wave being sufficient to stimulate all the other rounds in the line.

2. Submerged charges. Fig. 4c illustrates the way in which Cordtex may be used to avoid having the detonator and its electrical connections underwater. The charge may be in a plastic bag if it is Polar Ammon, gelignite but blasting gelatine is waterproof. The charge will need to be tamped as usual for maximum effect, since the low density of water renders it less efficient.
3. Multiple boulder cracking or multiple plaster charges can also be linked together with Cordtex for convenience as in section one.

Post explosion precautions

The source of danger next in importance to flying rock as mentioned previously, is the contamination of the cave or shaft atmosphere by the gaseous products of the explosion. These are principally carbon dioxide, nitrogen, carbon monoxide, and hydrogen. Small amounts of other gases are also present originating from impurities in the explosive or its wrapper and again upon the efficiency of the explosion.

The biggest danger comes from carbon monoxide which is colourless and odourless, and extremely toxic. For example, 3-4 hrs. exposure in an atmosphere containing only 200 parts per million (.02%) is likely to produce a headache in a resting individual. Vigorous activity is likely to intensify the effect and shorten the exposure period. Higher concentrations produce more serious effects in shorter times but an hour or two might elapse before the symptoms are noticed anyway. Hence the need for caution.

The amount of carbon monoxide produced depends upon a number of factors, but primarily the oxygen balance of the explosive; that is its ability to react to form basic stable gases; e.g. nitrogen, water vapour, carbon dioxide. Oxygen deficient explosives will produce larger quantities of carbon monoxide, whereas an oxygen positive explosive will have more tendency to produce oxides of nitrogen. The explosive manufacturer tries to maintain this balance whilst still achieving the other properties required. An interesting point here is that the waxed wrapping paper normally around cartridges can act as an inert filler and is very oxygen deficient with regard to its complete combustion. e.g.

Nitro-glycerine.	$4C_3H_5(ONO_2)_3 = 12CO_2 + 10H_2O + 6N_2 + O_2$	Positive.
Paraffin Wax.	$C_{19}H_{40} + 29O_2 = 19CO_2 + 20H_2O$	Negative.
Cellulose.	$2C_6H_{10}O_5)_n + 12O_2 = 12CO_2 + 10H_2O$	Negative.

It is not suggested that wrapping paper should always be removed but in a confined dig or badly ventilated passage it could help significantly to reduce the carbon monoxide emitted. An extremely detailed booklet (93pp) by the U.S. department of commerce bureau of mines contains the results of work with different explosives and the gases produced in metalliferous mines and hard rock tunnels. In all cases it was shown that carbon monoxide is the most important of the toxic gases produced. In the vicinity of sulphide mineral veins hydrogen sulphide can be produced which is also extremely poisonous, but oxides of nitrogen were rarely detected, and when present were in insignificant proportions, but occasions can occur when they are evolved in considerable quantities. (See C.R.G.transactions Vol. 6, No. 2 1963).

It can be seen that ventilation after an explosion is of prime importance, on the surface this is no problem but in some passages it can be serious. An open shaft can often be cleared by throwing down a bundle of burning newspapers, this causes convection which ventilates the shaft, however deep digs may be more of a problem. Deep inside a cave one has to rely on what little air movement there is, though in most cases after sufficient time this does seem to be adequate. Care is also needed when clay or earth has been blasted since gases can be trapped in the disturbed ground. One can only emphasise the need for caution before venturing back to the site of a bang.

The use of explosives in connection with caving has grown considerably during the last few years, and seems to be continuing on an upward trend. The benefits to be gained are considerable, but it must be remembered that explosives are potentially unstable chemicals, and that detonators are even more sensitive, so that they MUST ALWAYS be treated with respect and never with contempt, as this will inevitably lead to an accident.

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Continued on page 186

ODDS & ENDS

W.I.Stanton

The following consists of miscellaneous happenings which seem worthy of record but which have not so far as I know found their way into print.

Perrin's Rift 48165078 Altitude 315 ft. OD.

On September 14th 1965 Mr. Packer of Cheddar was driving his tractor across a field on the slopes above Draycott when the ground fell away behind him, revealing a deep rift. He at once contacted the police who in turn informed Nick Barrington who explored the cave the next morning. Nick showed it to me in the afternoon.

The entrance is 25 yards from the-northwest corner of a long field known as Perrin's, close to the top hedge; it is a round hole 2' across where a block of earth and stones only 2' thick gave way. Below is a nearly vertical rift 2' wide trending ESE, best descended on a 20' ladder. The east and west walls are jammed stones and earth, and the open space seems to have been formed by a cavity working up through the choke. It is old, though, as there is red "coral" stal on the walls near the bottom. Twenty feet down one alights on a steep earth slope that descends to a complete choke 30' below the entrance. The lowest 6' have been flooded and the walls are coated with thick mammilated stal, as in Axbridge Ochre Cave.

The cave shows signs of an unusual origin. Above the pool, a thick stal flow which once closed the rift on the east is now split down the middle by a fairly recent break, the south wall having pulled away about a foot to the south. The two faces of the break correspond exactly, showing that the break was purely mechanical. This suggests that the cave is a simple crack dividing the main mass of the hill from a detached block that has slipped towards the valley, like Canyon Cave and Black Sock Rift in Cheddar Gorge. There is little sign of solution, hence big extensions are unlikely to exist.

The cave is in massive Dolomitic Conglomerate with sub horizontal bedding, and one may ask why the rifting occurred at all. The hillslope to the south is not too steep to grow an annual strawberry crop, and hardly seems unstable. It may be that the crack was filled with water or waterlogged soil late in the Ice Age, and burst open with the periodic freezing of this medium. If so, Perrin's Rift is unlikely to be the only cave of its kind in the region.

At the time of the breakthrough Mr. Packer intended to either fill in the cave or use it as a reservoir! It was still open, rather insecurely capped with large stones, on 2.1.1966.

Tankard Hole

The entrance to this cave became blocked about 1962 and a great deal of assorted rubbish has been tipped into the doline since then. In March 1966 I observed that a hard track had been laid from the field gate to the lip of the doline, and, fearing imminent large-scale tipping there, ran a Grade 6 survey line from the nearest field corner to the collapsed entrance shaft, which still could be located to within a few feet. By this means R.D. Stenner's 1961 survey is tied to a fixed point on the surface, and even if the doline is completely filled future diggers will know where to sink their shaft to intersect the system.

The centre of the top of the entrance shaft is 152.5' at 256° true bearing from the northeast corner of the field, and is 33' lower than-ground level there. The position error due to possible inaccurate location of the entrance shaft is unlikely to be more than 6' horizontally or vertically. NGR of the field corner is

55684995.

Pride Evans' Hole

Between November 1964 and January 1965 some desultory digging was done at the end of this small cave in Cheddar Gorge by myself, Nick Barrington and others. The idea was to test the theory (Journal No. 95, p.84) that the debris cone of angular scree, mud and tree roots below a roof fissure was blocking a tunnel leading straight on.

Driving westwards for 6' on the north side of the choke we encountered a solid rock wall facing us, apparently the far wall of the roof fissure, with no sign of any tunnel below it. Frustrated there, we followed the fissure up for 6 or 7 feet, cheerfully dodging falling rocks, before abandoning the dig. The fissure presumably opens onto the hillslope above, where its entrance is hidden by scree.

The material excavated was mainly hard unstratified red-brown mud without archaeological remains, containing angular limestone blocks up to 2' long. Under the hanging wall of the fissure is a mass of stones cemented by tufa. Below the mud, on the sloping rock floor, is a layer several inches thick of sand passing down into gravel. It thins out to nothing as the rock floor steepens upwards to become the footwall of the roof fissure.

A washed sample of this sand proved to be well sorted, up to 5 mm grain size but mostly 1.5 mm, nearly all silicified limestone, in great part edge-rounded crinoid ossicles, with perhaps 1% limonite grains. This is very like a washed sample of gravel from below Thynne Squeeze in Cooper's Hole (60' lower on the opposite side of the Gorge) except that the latter is coarser, with a few quartz grains but no limonite.

The inner chamber of Pride Evans' Hole has evidently seen much excavation in the recent past, probably by Pride Evans himself. Part of a filling of tufa-cemented stones still remains in the roof.

Saye's Hole and the Cheddar Underground River

In February 1965 the roadside lake upstream of the Cliff Hotel in Cheddar Gorge was drained, and strong men from the Water Undertaking were scraping out the pondweed. The river was cutting gullies in banks of red mud and silt. The main stream, derived from the two highest risings, entered the lake under the bridge at the upstream end, but on the south side of the lake, emerging from low artificial arches below the road, were no less than 16 springs which together nearly doubled the flow. There were no springs in the floor of the lake or on its north side.

In September and October 1965 I assisted the CDG in certain non-recurrent operations in Saye's Hole which produced instant muddy water. The discoloration appeared in the second rising and in the lakeside springs (respectively 5 and 30 minutes later when the flow was weak) but not in the highest rising. The latter thus seems to be fed from upstream of the Saye's Hole slot, as indeed is suggested by the survey.

Downstream of the slot the underground river may reach the surface via a series of fissures in the solid rock. Alternatively, if these lowest reaches of Cheddar Gorge are now considerably aggraded, having been incised deeper during periods of low sea level in the Ice Age, the large river passage may open in a buried cliff, the water filtering up to the surface through a mass of boulders and scree. Perhaps the CDG will be able to throw more light on this interesting problem.

The natural passage in Aquarium Cave

In Journal No. 95, p. 83, I suggested that the main river tunnel in Cox's cave at Cheddar reappears at the lowest point in Aquarium Cave "and then, apparently, returns to the Gorge." When surveying Aquarium Cave in 1964 I found that the latter surmise was wrong. In fact the natural tunnel sinks below water level at the said point and is boulder choked; it is heading roughly west. The 2 mined tunnels apparently sought the continuation of this passage, so Roland Pavey, who drove them, must have had the right idea.

LIBRARY NOTES

Donald Thomson

The Library continues to expand. The output of caving literature is prolific, and what it lacks in quality it more than compensates for in quantity. Many of the Newsletters we receive are really intended to keep club members in touch with each other, but several important publications have been received. These include:-

Proceedings of the U.B.S.S. 1965-66

C.R.G. publications, consisting of:

Newsletters Nos. 102 to 104.

Transactions: Cave Surveying Vol. 8 No. 2.

The University of Leeds Hydrological Survey Expedition to Jamaica 1963
Vol. 9 No. 1.

Publication No. 14. The Oxford University Expedition to Northern Spain
1961.

Axbridge Caving Group & Archaeological Society Newsletters from August 66 to January 67.

Orpheus C.C. Journal Dec. 66.

Leeds University Speleo. Association. June-July 66 and Oct-Nov 66.

Chelsea Speleo. Society Oct 66, Jan 67 and Dec 66.

The Speleologist, April-May 66, Oct-Nov 66 and Dec-Jan.

Cerberus Newsletters.

Westminster Speleo. Group, July-Aug and Nov-Dec.

N.S.S. News Vol. 22 No. 2.

Vol. 24 Nos. 8, 9 and 10.

Bulletin Vol. 27 No. 4.

Spelunca Bulletin Vol. 6 Nos. 1 & 3.

The Belfry Bulletins.

The Plymouth Caving Group Journal.

The British Caver.

The Cave Diving Review 1964-65.

Devon Speleo. Society Journal No. 97.

M.N.R.C. News Sheets.

The U.B.S.S. Proceedings carried two articles of caving interest, one on the new discoveries in G.B. and the other on the solution of limestone in Mendip caves. The latter is by Derek Ford, who also publishes in the N.S.S. Bulletin on cave formation in Mendip.

The recent C.R.G. publications say a lot for the use of off-set litho.

NORTHERN NOTES

Gary Pilkington

Wessex members are in for rather a surprise when they next visit the Crown Hotel, Horton-in-Ribblesdale, which has recently undergone Hunters-type constructional changes. I'm glad to say it has not lost any of its former charms.

Burnley Caving Club have now recovered the electron ladder stolen from the Club hostel last September; the thieves, though, are still unknown. Burnley and Kendal Caving Clubs have both changed their Hostels in the Dales recently, Kendal have moved to the Giggleswick area and the Burnley have moved to Gearstones in the Ribblesdale district.

Alum Pot claimed yet another victim recently when John Drummond (22 years) fell 100 ft. to his death whilst climbing the Main Shaft (150 ft.) with a party of pupils from White Hall Open Pursuit School, run by the Derbyshire Education Committee. I should think that Alum must hold the world record for cave fatalities and in view of this it is a pity that the C.R.O. is not awake to the fact that Alum is no place for novices and, as such, novices should be discouraged from visiting the system.

Carl Pickstone's Lost John/Leck Fell survey project has been pipped on the post; apparently Leeds University have now published a Grade 5 survey of the system. However, old Griptonose is not easily put off and he intends to finish off the survey of Lost John (now half completed). Any help from Wessex people visiting the North is more than welcome. So far the people involved include Bob Pyke, Judy Clark, Gary Pilkington, Alan Brittain (B.P.C.), and several other members of the Bradford Pothole Club.

A new survey of Gaping Ghyll is now available from Peveril Underground Survey Association. Also Manchester University have published a survey of a recent discovery of theirs, Snorkell Pot which is about 3,000 ft. long.

On the 20th November 1966 Ken Pierce with John Sinclair, both B.S.A. members, dived in the final downstream sump of the Lost Johns Master Cave for about 400 ft. without reaching an airspace. They report that the sump appeared to continue quite roomy beyond the point reached.

On the same date John Southworth of the Happy Wanderers dived in the terminal sump of Hardrawkin Pot, but did not have any success.

The 3rd December 1966 saw Mike Boon assisted by Dave Cobbley and Gary Pilkington down Bull Pot Kingsdale. Mike dived in the 1948 series sump and reported the underwater passage as being approximately 4 ft. wide and 2 ft. high. He followed this for 40 ft. before returning. Mike thinks that the sump might go in a reasonably short distance.

On the following day Peter Livesey, Colin Vickers, Bill Frakes, Dave Cobbley (all B.P.C. members), and John Ogden (H.W.C.P.C.), dived 200 ft. in the upstream sump of Rowten Pot Kingsdale to find 600 ft. of fine streamway.

On 11th December 1966 Messrs. Frakes, Livesey and Vickers, whilst on a photographic trip in Langstroth cave, discovered about 300 ft. of new passage.

LESSER CAVING AREAS OF SOUTH WALES

John H. Jones

Now that the Severn Bridge has made the journey from the West Country much easier perhaps we will see a great invasion of South Wales by Mendip cavers. As a Welsh member of the Wessex club I would like to see many such trips to my home country. Probably the main draws will be Ogof Fynnon Ddu, Dan-yr-Ogof, Tunnel Cave and Agen Allwedd, where there are numerous possibilities of further discoveries. As we have seen, Wessex members were present during the discovery of Dan-yr-Ogof III.

Whilst most of the attention of the visits will be to the areas of South Breconshire, perhaps some cavers would like to explore South Wales for themselves. There are many other limestone areas present with probably many secrets to be discovered. This is proved by the discovery of the Ogof-Cilyr-Ychen (22/615165) by the B.N.S.S.S. near Llandybia. The Gower Peninsula contains many caves and probably many more are to be found.

To the north of Porthcawl, running N.W. to S.E., is a ridge of limestone 5 miles long. Its south eastern end is covered by sand dunes whilst its north western end is being extensively quarried. At the N.W. end at Cornelly a number of marl-filled potholes exist, whilst at the S.E. end are the Methyr Mawr Caves (21/889779). These are on private ground. In the same ridge there is a fairly large resurgence called Pwll Schwyll (21/856774), in times of flood water this resurges down a small valley near by.

Near Pencoed in Glamorgan is a limestone outcrop at Coed-y-Mwstwr Wood. The outcrop varies between 20-30 ft. in height at the top of a steep hill, so the limestone is probably much thicker. At its western end is a fairly spacious cave Coed-y-Mwstwr Wood Cave or Pencoed Cave (21/951809). This cave is about 200 ft. long between 5 and 15 ft. wide and well decorated. The cave closes down suddenly with four small tight passages continuing through loose boulder ruckle. For those interested in cave fauna I have seen many bats and spiders present. The whole cliff face is about 400 ft. long and contains many small holes.

When I was a schoolboy I heard many tales of caves and a vast underground lake at Coity. Of the underground lake I have not discovered anything further, but quite near Coity is a cave with 600 ft. of passages (21/9281). At Bridgend a road collapsed due to the washing out of gravel filled potholes 30 ft. deep. Also Bridgend and most of the Bridgend area receives its water supply from the Schwyll risings (21/887769). These risings are not open to inspection.

All this area occurs in the Southern Outcrop of limestone, and as this outcrop is not as vast as the Northern one probably no major caves like Dan-yr-Ogof or Swildons will be found. The area may, however, yield some smaller caves of interest to those who would like to explore for themselves.

BOOK REVIEWS

Merveilles Souterraines by Jacques Baures., 19 pages of French text and 80 photographs, published by Editions Albin Michel, 22 rue Huyghens, Paris 1961.

This book is a sequel to *L'Aventure Souterraine*, published in 1958. In his introduction the author comments on the fact that people marvel at the wonder in show caves where they can walk in comfort and safety, but he points out that a trip in a show cave is in no way comparable to the explorations of one of those Speleological Societies who seek to test the limit of human endurance in a natural cave, where man has to tackle natural obstacles with protective clothing, ladders, ropes, diving equipment and, of course, portable lighting equipment.

He mentions some great achievements in exploration over the past few years. The sixty-five trips necessary to complete the exploration of the 17,148 m. (10 mile) long streamway of the Dent de Crolles, not far from the Gouffre Berger, near Grenoble, the "deepest cave in the world", itself the scene of numerous speleological probings. He recalls the incident in 1948 when seventy-five speleologists banded together on a massive assault on the Caladaire Cave, 487 m. (1,600 ft.) deep, and the nine day underground sojourn in 1947 necessary to complete the exploration of the cave of Lombrives.

Expeditions of this nature are not peculiar to France and Europe, but also take place in the United States of America, where a tourist trip in the Mammoth Cave, Kentucky, can take up to 7 hours and cover 11 km. (7 miles).

Monsieur Baures also covers the contribution which Speleology makes in the fields of science, including Hydrology, Mineralogy, Geology, Palaeontology, Zoology, Medicine and Psychology, etc. He describes the different types of formations and their genesis, and delineates more notable examples. He gives a short history of speleobiology and the life of prehistoric man in caves.

Monsieur Baures has sought, and succeeded, to portray some of the wonders encountered in the underworld, by a unique selection of excellent photographs, both in colour and black and white. The series of photographs illustrating this book have to be seen to be appreciated and no written description can do them justice.

There is a fine selection from the cave of Empreintes, and a spectacular free 45 m. (150 ft.) ladder drop in the cave of Lombrives. There are pictures of cavers practising climbing techniques in the open air, pictures of cave paintings, pictures of myriads of formations in every shape and hue, plus many more.

This book is most enjoyable, not only in view of the cave photographs, but because it contains what is possibly the best concise introduction to speleology which has ever been written.

A.D.O.

Shepton Mallet Caving Club Journal Series 4 No.1. June 1966.

17 pp. 6 surveys. From: Hon. Editor, R.D. Craig, 31 Cranbrook Road, Redland, Bristol 6.

The new Editor has made a clean sweep and produced a quarto sized journal instead of the old sixmo size.

The Journal covers a remarkably wide field for a Mendip-based club. The first article entitled "Discovery of Downstream Section of St. Catherines 2" describes, with a survey, over 1,000 feet of new cave passages in County Clare, Ireland. This is followed by "A survey of an extension to Lost John's Cave" (Yorkshire), a 600 ft. series off Lyle's Cavern.

The two concluding articles describe a number of caves in North Wales, again illustrated by surveys.

About Caves Muller's Junior Look, Read & Learn Series, No. 8, by Terry Shannon, Illustrated by Charles Payzant. 47 pp, published April 1966 by Frederick Muller Ltd., London, at 9/6d.

The book was first published in America in 1960 by Melmont Publishers Inc. It is mainly written for children in the 8-10 age group. The large type-face and many lavish illustrations assure one that it will be easily read and understood by most eight year old children.

Miss Shannon begins with describing how caves are formed, and how stalactites grow. The different types of caves, limestone, lava and sea caves are described. The book is concluded with a variety of stories centred around famous American Caves, like the discovery of Carlsbad Caverns, and the lone explorations of Floyd Collins, all of which makes interesting reading for the parents as well as the eight year old!

The manuscript was checked by Dr. Mark Raymond Harrington, Curator of the South West Museum, Los Angeles, California, and is both interesting and accurate, although it does contain many American terms including that horrid word 'Spelunker' for caver.

A History of Lead Mining in the Pennines by Arthur Raistrick and Bernard Jennings, 347 pp. 5 figs. published by Longmans, Green & Co. Ltd., London, 1965.

Dr. Raistrick, Sometime Reader in Geology, Kings College, Newcastle-on-Tyne, is well known for his many papers and books on lead and iron mining. B. Jennings, M.A., Lecturer in History, Extra Mural Department, University of Leeds, writes mainly on sociological aspects of lead mining.

These two leading experts on the lead mining industry of the Pennines have collaborated to produce a reference work, surpassing all the previous literature on this subject.

This book presents a readable and authoritative account of nearly two thousand years of lead mining in three major areas; Derbyshire, West and North Yorkshire, and Alston Moor, with the areas of Teesdale, Weardale and part of Northumberland.

The book commences with the period just before the Roman conquest. Most of the records of this time have been based on the many pigs of lead which have been found in this area. The history of mining up to the twentieth century is recounted, beginning with the earliest type of open cast mining, that of hushing or allowing a strong flood of water to flow down a hillside. This removed the surface layer of material and exposed the lead bearing veins beneath. The later methods of deep mining, with the introduction of pumps and drainage soughs, are also delineated.

The book will undoubtedly be classed as a major reference work on this subject, for the Pennines, as is Gough's Mines of Mendip, for the Somerset region.

SPELÄOLOGISCHES FACHWÖRTERBUCH (Technical Speleological Dictionary).

General Editor, Dr. Hubert Trimmel. 109 pp. 20 illustrations. Published by the Country Society for Cave Knowledge in Vienna, and Lower Austria. Vienna 1965. (The book also appears as one of the publications of the Third Congress of Speleology Vienna 1961, and as Year Volume 1964 for Karst and Cave Knowledge of the Society of German Cave and Karst Explorers under the title "Fachwörterbuch für Karst- und Höhlenkunde" (Technical Dictionary for Karstology and Speleology))

This is a most impressive glossary consisting of over 700 entries, the work of thirty-nine speleologists in Austria, Germany and Switzerland.

Any science in order to be precise should possess a standardised terminology. In the past confusion has arisen by different authors using the same words but with different meanings, so the need for a work of this nature is very real indeed.

The definitions on the whole are very conclusive. To use the term Bergmilch as an example, it not only gives descriptions for the wet and dry forms, but also refers to the English and French synonyms - Moonmilk, and Lait de Lune. The explanation of the origin of the term states that this is not derived from any connection with the moon, but is named after a cave called Monloch in the Lucern Canton of Switzerland. A brief bibliography follows, which not only encompasses the many important foreign works on the subject, but also includes Ann Mason Williams paper in the Transactions of the Cave Research Group.

The German word Siphon (Sump) is another good example. In this case the various kinds of sumps are divided into two types. The first type are inclusive of those where the passage is blocked with a solid, this can be either a sediment (sand, mud etc.) or stalagmite or ice. The second type includes sumps where the passage is blocked by a fluid, and this type is further subdivided into a flowing sump, in a streamway, or a lake sump, where the water is stagnant.

The general trend for the definitions is both learned and concise, making it an invaluable reference work. Omissions are few and far between. The only point which I noticed was under Aragonite, where it might have been of interest to mention the fact that the name comes from the Aragon district of Spain where it was first found in 1775.

The twenty illustrations are of a truly international character. The picture of Tower Karst is from Southern China, a very fine example of a Rimstone pool comes from Akiyoshi Cave in Japan. A cave lake in Hungary and Cave Pearls from Italy are also illustrated.

Needless to say whilst the glossary intrudes into the spheres of Geology, Zoology, Mineralogy and Palaeontology, these terms are only included where they have a definite cave connection.

Although the text is in the German language it will prove an invaluable book for British speleologists, both for translating caving literature in the German tongue, and to assist in solving some of our own technological problems.

A.D.O.