

WESSEX CAVE CLUB

Journal No. 122, Vol. 10

April 1969

CLUB NEWS

Work goes on apace at Upper Pitts, and we are looking forward to a large task force at weekends to complete the jobs listed in the last issue of the Journal.

Members are reminded that Charterhouse Caving Committee permits are required to visit Longwood Swallet and G.B. Cavern, and the smaller caves in the vicinity. Many of the three year old permits issued are becoming out of date, and so you are urged to note when your permit expires. Please renew your permit through the Assistant Secretary, Roy Staynings, 8 Fanshawe Road, Hengrove, Bristol BS14 9RX, and enclose a stamped and addressed envelope for its return. For information, the Hon. Secretary of the C.C.C., is now:

Tony Knibbs (Mendip Caving Group),
2 Rectory Lane, BYFLEET, Surrey.

Bob Wall has a supply of caving helmets with lamp brackets. He is selling them at 12/6 each, so if any member would like one please send details and money to:

174 Bryant's Hill, Bristol 5.

A list of items and equipment currently available through the Club will be found over page.

At the beginning of this year Miss Sally Merrett mislaid a Kiengle travelling alarm-clock at Hillgrove. If anyone has found this perhaps they would let the owner know as soon as possible at:

14 Beaufort West, Bath.

Early in March the electric slot meter at Hillgrove was broken open and its contents removed. This deplorable act follows a spate of thefts associated with caving huts on Mendip, which includes the removal of tackle and money from the clothes of people having changed and gone underground. The conclusion that this is the work of someone (or of persons) connected, or at least well acquainted, with Mendip caving seems inescapable. Please ensure that Club property and equipment is safeguarded, and that you take care of personal items in your own interests. If anyone has information about the theft at Hillgrove please contact the Hon. Secretary. In the long run we must rely on the honesty and integrity of those who go caving; it will be a sad day if controls have to be tightened up because a few behave selfishly and irresponsibly.

In connection with the forthcoming Cave Research Group Southern Meeting on Saturday 19th April, the Bristol Exploration Club as local organisers will mount an exhibition on Caves and Caving at Wells Museum from 14th - 25th April 1969. We understand that the C.R.G. Meeting will take place in the Swan Hotel, Sadler Street, Wells, and that arrangements are being made by

Alan Thomas. Club members who propose to attend the lectures will be interested to hear that there will be talks on local topics including Surveying Problems in St. Cuthbert's Swallet, and The Frequency of Severe Storms on Mendip. Further details may be obtained from Alan Thomas, or from the Hon. Secretary of the C.R.G., who is now:

Dr. Alan Fincham,
36 Kingsway, Woking, Surrey.

Tony Phillpott is planning to make a cine film on some historical aspect of Mendip caving, and invites all those interested to get in touch with him at:

3 Kings Drive, Bishopston, Bristol 7

Members will be interested to hear that at an inaugural meeting of the Council of Cambrian Caving Clubs last January The Wessex were accepted as a member organisation. The Cambrian Council is closely modelled on the Council of Southern Caving Clubs, and brings together all bodies with an active interest in caving in the Principality. Its parent organisation, the Cambrian Caving Conference, did much to promote the aims of a Cambrian Cave Registry on the lines of the one on Mendip, and a progress report from its Hon. Secretary appears elsewhere in this Journal.

We welcome the following new members elected 26-1-69:-

K. Neill, 7 Bedwyn Close, Swindon, Wilts.
M. Barton, Farlea, Holcombe, Bath.

SALES SERVICES

Numerous useful items of equipment are available through S. Causer, The Cottage, Rectory Lane, Timsbury, Nr. Bath. The following list gives prices of the principal goods in stock. Complete details are posted at Hillgrove.

Edison Cells with switched headpiece	30/-
Edison Cells with unswitched headpiece	20/-
Electrolyte per lamp	1/6d
Nife headpiece main bulbs	4/-
Nife headpiece pilot bulbs	10d
Steel vents for Nife Cells	1/3d each
Armour plate glasses for lamps	2/3d
Reflectors	2/6d
Carbide	1/9d per lb
Club badges for blazers	5/6d
Club ties	17/6d

Club car badges are available through Christopher Hawkes, 10 Christchurch Road, Bristol BS8 4EE, but since these are expensive to purchase singly it is preferable to have a collective order placed.

CLUB MEETS

Tuesday 1st April 1930 hrs Library Night with C.J. Hawkes
(address above).

<u>Weekend 3rd/4th May</u>		<u>South Wales*</u> Leader: T.E. Reynolds, 23 Camden Road, Bristol BS3 1QA.
<u>Tuesday 6th May</u>	1930 hrs.	<u>Library Night</u> (see page 267).
<u>Wednesday 14th May</u>	1800 hrs.	<u>Upper Swildons</u> Leader: R. Woolley, 6 Devonshire Road, Bristol 6.
<u>Tuesday 3rd June</u>	1930 hrs.	<u>Library Night</u> (see page 267)
<u>Weekend 7th/8th June</u>		<u>Devon</u> Leader: D.M.M. Thomson, "Pinkacre", Leigh-on-Mendip, Nr. Bath. Camping 3 miles from Buckfastleigh.
<u>Sunday 15th June</u>	1030hrs.	<u>G.B. Cavern</u> Leader: J.D. Hanwell 50 Wells Road, Wookey Hole, Wells.

Provisional Meets (Full details in the June Journal)

August or September. Steep Holm. Leader: R.J. Staynings.

September or October. Portland Caves. Leader: M.W. Dewdney-York.

* Denotes wet trips for which suitable lighting and clothing are considered essential.

THRUPE FARM SWALLET DIG

Tony Dingle and helpers have already started work at this dig and report the prospects as encouraging. It is proposed to work at the site every other weekend throughout the coming summer. The first real push will start over the Easter holiday, April 5th/6th. All interested diggers should get in touch with Tony at his home address (below), or at Hillgrove.

<u>Hon. Secretary:</u>	D.M.M. Thomson, "Pinkacre", Leigh-on-Mendip, Bath, Somerset.
<u>Asst. Secretary:</u>	R.J. Staynings, 8 Fanshawe Road, Bristol BS14 9RX.
<u>Hon. Treasurer:</u>	T.E. Reynolds, 23 Camden Road, Bristol BS3 1QA.
<u>Subs. Treasurer:</u>	A. E. Dingle, 32 Lillian Road, London S.W.13.
<u>Hut Warden:</u>	M.W. Dewdney-York, Flat 2, 11 Southleigh Road, Clifton, Bristol 8.
<u>Journal Distribution:</u>	P.R. Cousins, 3 Kinver Road, Sydenham, London S.E.26.
<u>Club Meets:</u>	Jenny Murrell, 1 Clifton Hill, Bristol BS8 1BN.
<u>Editor:</u>	J.D. Hanwell, 50 Wells Road, Wookey Hole, Wells, Somerset.

CAMBRIAN CAVE REGISTRY: A PROGRESS REPORT

The first Cambrian Caving Conference decided to set up a Cave Registry for Wales and so a committee was elected to implement this.

Wales and the Marches were divided into the following six areas; North, Mid, West, Gower, South Glamorgan and Northern outcrop. Gloucestershire originally an area withdrew to compile its own registry, thus taking responsibility for the Forest of Dean area.

The size of the task (approximately 10,000 square miles and over 10,000 possible sites) discouraged some of the first volunteers and so in July 1967 it was necessary to give the registry six months to succeed or disband. This ultimatum, together with the appointment of some new registrars, stimulated action and the registry is now a successful concern.

The registry is becoming the encyclopaedia of sites of spelaeological interest, including the metalliferous mines, in the region. Brief details of each site, together with a complete bibliography is recorded on separate sheets, which are filed according to grid reference, and cross referenced alphabetically. The sheets are bound in twin-lock loose leaf binders with illustrative maps. So that we are fully functional at all times, the information is also indexed on punch cards. This system is specifically designed to answer postal enquiries. When ready the registries will be deposited in libraries at strategic points in Wales.

We have, at the moment, details of over 200 sites and are entering the critical phase, where the fine detail of each area is being sought. If you know of any site not included in "Caves in Wales and the Marches", then note brief details of it, together with a grid reference and send it to me. Alternatively, how about you offering us your services on a semi-permanent basis?

Much more field data is required, but already we can offer the finest bibliography to over 200 sites; and eventually the registry will be the reference volume to which cavers will turn to see if anything is written about a site. Anybody helping us can be proud of doing a job which will be of increasing use and importance in the future.

The registry does not have a regular source of income, but relies for its finance on voluntary donations made in response to an appeal to Caving Clubs and Scientific Societies interested in the caves of the principality.

The original appeal in 1965 requested a sum of £50, and realised only £26; but with that sum we have achieved our present position.

We now estimate that to complete the work as originally envisaged, we require a further sum of £70. If this appeal realises this figure, with care and economy it should be unnecessary to make a further financial appeal for several years; so could you please make as generous a donation as you can reasonably afford.

Cheques should be payable to: Cambrian Cave Registry.

On behalf of the Officers of the Registry,

Yours sincerely,

W.H. LITTLE
CHAIRMAN

N.S.J. CHRISTOPHER
SECRETARY/TREASURER
9 Somerset Road,
FROME, Somerset.

IMPORTANT NOTICE - CHEDDAR CAVES

The Committee advise all members not to enter into any agreement with the M.N.R.C. concerning access to the caves on Lord Weymouth's land at Cheddar, until more satisfactory arrangements are announced through the Journal.

DRAWING CAVE SCENERY

by Glenn Tomkinson

Almost from the start of caving in Mendip, underground scenery has presented a challenge to photographers, but in spite of the fact that drawing and painting offer a more versatile approach to the problem of portraying the interior of caves, it has attracted few artists. The reasons for this have been both aesthetic and technical.

As with photography, one aesthetic problem is lighting. In daylight there is only one source of light, the sun, but in a cave one's sources are infinitely variable in number, position and brilliance. The most obvious light source to work from is one's helmet light, but here again a problem is presented. Is one to show the beam as stationary or movable? The latter is certainly more true to life as the image one has of a cave scene is a composite one built by the moving beam of light as one turns one's head to look at different parts of the cavern. It is important not to light the scene too brilliantly all over but to retain the sense of light in darkness. On the question of lighting, the artist has the advantage over the photographer in that he can use light as he pleases to give a particular effect. I have a pastel drawing of the 40' which is taken from an original sketch lit from the ledge opposite the pitch, (where I was sitting) the ladder itself, the bottom of the pot and the top of the ladder. So that all the formations are clearly shown. I have retained the effect of the lights but erased their source.

The second aesthetic problem is that of a frame. Those who know the frontispiece to Balch's 'Mendip, its Swallet Caves and Rock Shelters' will understand what I mean. It seems to be a mixture of a three dimensional painting and a diagrammatic cross section showing the whole of the 40' pot and part of the passage below. Thus the picture frame is in effect the cross section of pot and passage which is an obvious visual improbability. The artist would have done better to content himself with the view from the aperture of the passage lighting the scene from above to give the impression of a continuation upwards. I have found that the most satisfactory result is obtained by framing the brightly lit part of the cave in the shape of the passage. Sometimes I have cut out my drawings in that shape and remounted them; after all, as anyone who saw the 1967 Miro Exhibition will realise, there is no particular virtue on a rectangular frame. I must point out here that I am not wedded to photographic realism, the whole point of drawing in caves is that it is much more flexible than photography, but it is important to make the picture plausible.

What I have aimed at in my work is an impression of 'cave-ness', an evocation of what it is like to be in a cave. This usually involves, as in any picture, a process of drastic simplification and disregard of detail, except where it enhances the whole. I have always been fascinated by the beautifully sculptured "Tate Gallery" in Swildons 4, but for a long time I was unable to give the sense of lofty wild grandeur which the passage has until I gave up bothering to try to show the scalloping on the walls and concentrated on the series of upward sweeping curves that form the arch of the passage.

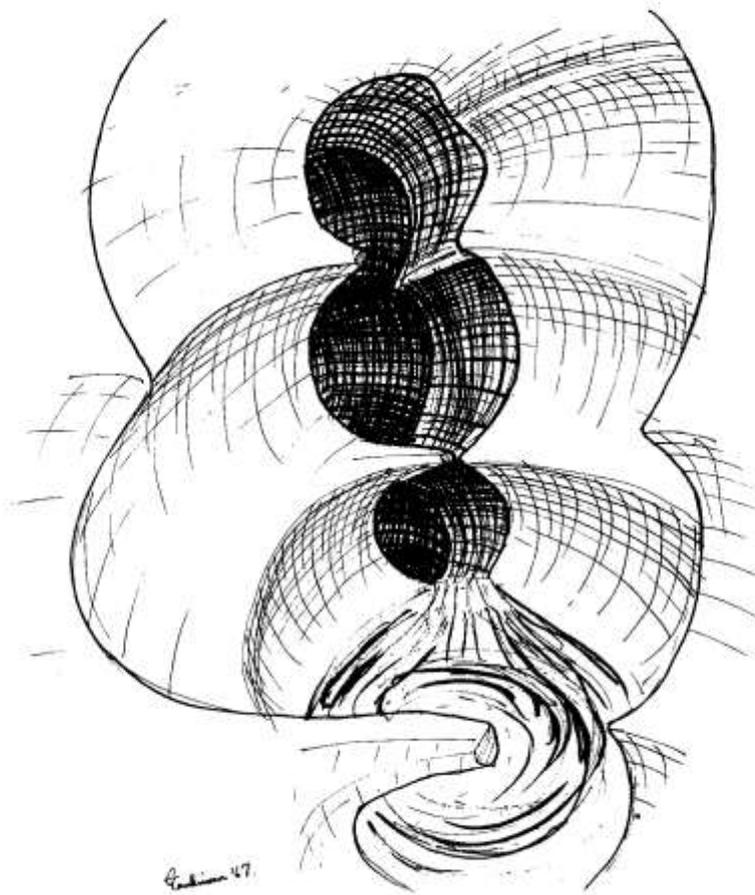
The main technical problems are, of course, cold and damp, so that one wants a medium that is both quick and waterproof. I favour drawing with a felt ink marker of the instant drying



40 ft Pot, Swildons, by Glen Tomkinson
Reduced from an original Black and White ink drawing. 19" x 22"

waterproof variety on a cardboard covered in white fablon. With these materials one can quite happily drop everything in the stream without damage and any muddy smears can be washed off afterwards. (Surveyors might find this idea useful too). My drawings done in the cave are usually quite disgraceful and I therefore re-draw them in another medium. I favour oil pastels which have all the virtues of ordinary pastels but give a shiny finish which is what one wants for the wet rocks of a cave. I find it useful to make colour notes on my drawings as it is not always easy to remember colours afterwards.

In my own view, the accurate portrayal of a scene has been seriously challenged by the coloured photograph. The fact of artificial lighting makes cave scenery an entirely different proposition, an accurate portrayal after all would be pitch black all over. Cave scenery is a virtually unexplored field where the artist is probably better equipped than the photographer. He can draw what he actually sees, while the photographer can only show what is seen by his camera lens.



Tate Gallery, Swildons Four, by Glen Tomkinson
Reduced from an original Black and White ink drawing. 15" x 17"

WITH GOD ON OUR SIDE

by Dave Drew

Five months in the periglacial, karstless wilderness of the Canadian Prairies having brought me to the verge of insanity, I decided that Christmas would constitute a desperate attempt to reach and descend a cave, come what may. Mere 1000 mile weekend forays to investigate isolated blue specks on the geological maps of Montana and Alberta had proved speleologically fruitless and thus the destination was Utah about which I knew but two facts - it had caves and cavers, and its populace was 80% Mormon. Later, further snippets came to light, notably that the 'Latter Day Saints' disapproved of alcohol, cigarettes and contraception thereby leaving caving as my sole raison d'etre.

Pausing at the Utah border to fill the car to bursting point with beer and cigarettes, I continued with some trepidation to my rendezvous with the cavers of Salt Lake City. Although apparently human to the sight and touch, the Mormon ensemble soon presented a veritable minefield and I - having only the vaguest notion of where Mormon dogma ended and Jehova's Witness prejudice began - found it safer to remain virtually mute during my week's stay, thereby reducing somewhat the icy stares of disapproval that greeted the mildest essay into repartee. Evenings in my motel room were spent alternately refusing telephoned 'sincere' exhortations to attend prayer meetings and consuming prodigious quantities of alcohol and tobacco. Gideon's Bible proved its worth in furnishing me with conversational tit-bits for the next day's ordeal.

Highlight of the first cave visited was a five mile ride across the snowy desert in a Snowmobile, which would overturn at high speed with monotonous regularity, thereby severely crushing its occupants. The cave itself, entered by a 60 foot vertical shaft which gushed forth hot steamy air, was curiously located on the summit of a low, domed hill standing above the surrounding salt-flats. Below the entrance pitch the cave resolved itself into an undistinguished dry, dusty passage leading steeply down the dip for some 5-600' horizontally and 550' vertically. The rather pedestrian nature of the system was somewhat enlivened by the abundance of assorted fauna living full and active lives within its warm confines. It was rather disconcerting, whilst traversing a pit, to place one's foot in a crevice only to hear an enraged rattling and watch helplessly while a sturdy rattlesnake sank its fangs optimistically into one's caving boot. The most trying period was the return climb up the entrance ladder which involved attempting to persuade rattlesnakes to remove themselves from the rung immediately above one's head, while simultaneously avoiding being bitten and remaining on the ladder.

The Lord was with us however

The only cave possessing any real caving interest was located in the heart of the desert near the Utah-Nevada border. This cave, its entrance in a rocky cliffside, consisted of a maze of passages (totalling some 1200' in length) on several different vertical levels linked by numerous shafts. Now infinitely dry, the origin of the cave is not easy to visualize as subsequent deposition and collapse must have modified its original form out of all recognition. Speleogenetic speculation on my part was soon aborted when I became aware that belief in water-tables comprises an integral part of Mormon dogma (Genesis 17, 4).

It was during this trip that relationships with my fellow cavers came under maximum stress. Following the ritual cafe stop prior to descending the cave, I had not thought it necessary to bring food for consumption on such a relatively short and straightforward trip. Within 10' of the cave entrance however, the entire party sat down as one man, opened vast knapsacks, and proceeded to eat solidly for 45 minutes. Whole chickens appeared and disappeared; tins of soup, of fruit-juice, of meat; jam sandwiches, eggs, oranges, sardines - all were devoured. Taking advantage of their apparent pre-occupation I attempted to slink into a nearby side-passage for a cigarette only to be flushed out within seconds by a posse of alert spelunkers lecturing me on the follies of solo-caving. Eventually, satiated, they re-lit their haloes and moved on. Within 200' we had reached a drop necessitating a ladder, and within seconds of arriving bags were re-opened and they were all at it again. I finally lost count of the times this saga was repeated. To me, the most vivid memory of Utah's caves, will be the rhythmic sounds of mastication in the darkness.

At long last the opportunity presented itself for me to escape from my misery - after a mighty struggle I threaded myself through a squeeze which no-one else felt inclined to attempt, and reached a short section of new passage. Safely ensconced beyond reach, and ignoring the distant tumult of agitated voices, I filled the air with dense cigarette fumes until forced to retreat to avoid asphyxiation.

After re-joining the party we continued at snail's pace around the remainder of the cave, pausing at intervals to heap appropriate praise upon some wretched, withered projection of calcite variously glorified by the title 'stalactite', 'helictite', 'curtain', 'angel's wing' et al.

At long last (and coincident with the exhaustion of food supplies) we had 'done' the cave and lumbered slowly back toward the surface. Within a few feet of the surface however, my day was made. God, apparently under the impression that we were safely out, had momentarily turned his attention elsewhere. Immediately a 'Saint' fell down the pot we were traversing. Greatly cheered by this, I watched from my perch in the roof as the unfortunate (sprained ankle) was rescued - with the inevitable cornucopia of food thrust upon him - a pleasant end to a thoroughly rotten day.

GOING METRIC

by J.D. Harwell

Since 1960 about forty countries have decided to adopt metric units as the only system of weights and measure that will be legal. For many the conversion is straightforward, but discarding of our own complex Imperial Units will not be easy. In the U.K. the changeover will parallel that proposed for coinage and currency under the terms of the Decimal Currency Act 1967. The latter will take effect on 15th February 1971, and both are already being phased-in to the traditional systems. The proposed year for going completely metric is 1975. While the rationalisation of currency requires just a relatively simple numerical transfer, metrication involves completely new names for physical quantities as well. We will have to begin thinking, visualising, and calculating weights and measures in quite different basic units, multiples and their various derivatives. The adjustment problem is slightly compounded by certain "amalgams" of Imperial and metric systems already adopted in specific fields. In some respects evolved systems have definite advantages, apart from likely reactionary views. But, international usage must clearly take precedence.

The traditional metric system was widely adopted after the French Revolution. Since its introduction numerous refinements and additions have been made to make it logically superior and more convenient than any other system. Its chief merit is considered to be the economy of fundamental units to embrace the whole range of physical quantities requiring exact definition. The need to write large numbers of zeros can be countered by using the appropriate powers of 10, and/or a suitable prefix as shown in the following table:-

Fraction or Multiple	Prefix	Notation
10^{-9}	nano-	n
10^{-6}	micro-	μ
10^{-3}	milli-	m
10^{-2}	centi-	c
10^{-1}	deci-	d
10	deka	da
10^2	hecto-	h
10^3	kilo	k
10^6	mega-	M

N.B. Notations or symbols for units do not take a plural form.
Also compound prefixes must not be used.

The international body called the Conférence Générale des Poids et Mesures has been responsible for effecting acceptable improvements of the metric system. That finally approved in 1960 was entitled the *Système International d'Unités*. Since this conveniently abbreviated to S.I. in the dominant romanised languages, the revised metric system is referred to briefly as the

SI System. Basically there are six fundamental units, the metre and kilogramme taking the place of the centimetre and gramme of the original metric system, viz.

Physical quantity	Name of SI unit	Symbol for unit
1. length	metre	m
2. mass	kilogramme	kg
3. time	second	s
4. electric current	ampere	A
5. thermodynamic temperature	degree Kelvin	°K
6. luminous intensity	candela	cd

In addition there are two supplementary SI units which are dimensionless:-

Physical quantity	Name of SI unit	Symbol for unit
plane angle	radian	rad
solid angle	steradian	sr

The unit of force is derived from the first three basic physical quantities of the SI system, being named the newton (kg m/s^2). Since the newton is independent of the Earth's gravitation it is thus no longer necessary to introduce the often confusing g into equations.

The symbol for the newton is N . Other essential derivatives with special names are the joule (J), being the product of the newton and metre, and the watt (W) which in turn is a measure of joules per second. Respectively therefore the newton, joule, and watt refer to the physical quantities of force, energy, and power. Customary temperatures will, of course, be given in degrees Celsius ($^{\circ}\text{C}$); the common units of time (e.g. hour, year), and the angular degree with its components (minutes, seconds) clearly remain unaltered, (although, there has been discussion about a 400° circle).

The following table lists typical physical quantities in terms of the above basic units

Physical quantity	Name of unit	Symbol for unit
area	square metre	m^2 (or sq.m)
volume	cubic metre	m^3 (or cu.m)
density	kilogramme per cubic metre	kg/m^3
velocity	metre per second	m/s
acceleration	metre per second squared	m/s^2
pressure	newton per square metre	N/m^2

Considering the simplicity of the system it is, perhaps, a little unfortunate that in certain fields alternatives have evolved which may be used in conjunction with those previously

given. For example, in Meteorological work the bar (10^5N/m^2) is used universally to measure air pressure, and in Nuclear Physics the curie (Ci , $37 \times 10^9\text{s}^{-1}$) is used to measure radioactivity. Also, in the fields of industry and commerce, the hectare (ha , 10^4m^2), the litre (l , 10^{-3}m^3 or dm^3)*, and the tonne (t , 10^3kg or Mg) are widely used to measure area, volume, and mass. Their retention should not impair the overall framework of the SI System.

Since we shall now be dealing with largely unfamiliar measurements and the relations deduced from them, we shall have to exercise particular care when stating data. In principle, every measurement is a comparison between the quantity measured and another, namely, the unit. Before dismissing this observation as trivial, it should be remembered that only the numerical value and the name of the unit together make any data complete. Units must be described completely when first mentioned in texts, tables, diagrams, and especially formulae. General descriptions or notations, such as "cgs", should be avoided initially, and only used after a clear indication of what they stand for has been stated. This will be particularly the case with the elements of equations used for calculations; the units must be stated for which it is valid. There is, of course, an increasing tendency in science and technology to present formulae in a general symbolic form that is altogether independent of any choice of units, and this too must be pointed out wherever relevant. However, for the most part, it is not possible to exclude the use of numerical equations when expressing empirical relations. Thus, it is as well to remember that a physical quantity is the product of the numerical value measured and the unit used, i.e. in broad terms, a number with a name attached. When dealing with fractions and multiples of basic, supplementary, and derived SI Units, where possible any numerical prefix should appear in the numerator of an expression.

The SI System is being prompted in the U.K. by the main official bodies under the auspices of the Standing Joint Committee on Metrication of the Ministry of Technology. Over a year ago, the transfer was supported by the Confederation of British Industries, the Royal Society, and the Council of Engineering Institutions. Thus, its introduction into the spheres of industry, commerce, science, technology, and education has been assured. Predicted price differences favouring metric commodities will be another incentive. 1969 will be a critical year, when SI Units will completely replace Imperial Units in Higher Education. Already, most learned societies have anticipated the change in their journals. This was agreed by the Royal Society Conference of Editors on 10th December 1967 in London. During the interim period, the general practice has been to use metric SI Units, quoting Imperial equivalents in brackets afterwards. Where measurements have been taken on instruments calibrated in Imperial units however, the actual values recorded are quoted of course and a conversion factor to SI units given in brackets.

*In fact no rigorous definition of the litre is possible since an exact standard is difficult to achieve. Some authorities object to its retention at all.

As we are currently midway through Volume 10 of our Journals (bimonthly from February 1968 to December 1969) we shall continue to use the old system of weights and measures for the sake of continuity. However, since Volume 11 starting February 1970 will run past the date scheduled for a more widespread use of SI Units, and Decimal Currency for that matter, it seems appropriate to discard the old time-honoured Imperial units then. We have less than a year's grace in which to adjust.

The time is ripe to reflect on the outcome of going metric so far as caving is concerned. There will be many changes of course; in the specifications of tackle, equipment, and so on. But, the most significant adjustments must come in our general conversation about caves, and in the maps we use. Clearly, old established names like "20 Foot Pot", "380 Foot Way", etc., must remain; however, one imagines it will take several generations before we hear spontaneous remarks like, "We pushed the final choke over 100 metres today..... can I have another half litre of bitter please Ben...." The adoption of metric SI Units on cave surveys and topographical maps may help speed up the transfer and reduce the difficulties of communication between the coming generations of cavers and ourselves. What are the professional surveyors and cartographers doing in this respect?

In January 1967, the Hydrographic Department announced that they were discarding fathoms in favour of metres on Admiralty Charts. Their first map, using bathymetric contours at 2,5,10,20,30 and 50 metres, with "spot" depths under 10 metres in metres and decimetres, was published on 29th March 1968. After 1972 all building plans and drawings for public works will have to be in metric units; there will be a two year transition period as from 1970. Now, as drawings submitted for planning approval must contain large scale site plans abstracted from Ordnance Survey maps, it is clear that the O.S. must begin to introduce suitable metric versions very soon. The basic problem here is not, so much the scale as the method of presenting the topographical information. The following lists indicate the scales of current Ordnance Survey maps and plans (excluding discontinued series which may, nevertheless, be the only versions available for some areas).

Map scales	Plan scales
1:1,250,000 (c.20 miles to 1 inch)	1:10,560 (6 inches to 1 mile)
1:1,000,000 (International)	1:2,500 (c.25 inches to 1 mile)
1:625,000 (c. 10 miles to 1 inch)	1:1,250 (c. 50 inches to 1 mile)
1:250,000 (c. ¼ inch to 1 mile)	NB. Most cave surveys fall within the scale range 1:1,000 to 1:50. Common ones are 1:250 and 1:500.
1:100,000 (c. ½ inch to 1 mile)	
1:63,360 (1 inch to 1 mile)	
1:25,000 (c. 2½ inches to 1 mile)	

As can be seen, the One-inch and Six-inch scales are effectively the only non-metric series. However, only a slight enlargement of each to 1:50,000 and 1:10,000 respectively would make them decimal scales. In itself this would not be difficult but, there is much more to it than simple enlargement (Sexton. 1968).

The two main problems are, firstly, the quality of the overall map design and, secondly, the representation of numerical information. In the former it is clear that the optimum balance between information shown and space available would be upset. Rightly, the Ordnance Survey are jealous of their draughtsmanship and are reluctant just to "blow-up" the One-inch map to 1:50,000. It will take time to develop an acceptable design for the new scale. This is not so serious regarding the proposed enlargement of Six-inch plans to a 1:10,000 scale, but it is still valid nevertheless. The most significant numerical information given on topographical maps is the elevation of the land (in feet above a datum, as on contours and spot heights such as bench marks) and, on some scales, the areas of parcels of land (in acres). The National Grid Reference System is already in a metric form of course. While there is general agreement for redrawing contours at suitable decimal intervals (e.g. 9 metres is considered the ideal interval for 1:50,000, 1:25,000 and 1:10,000 scales in this country), it is clear that the abandonment of the acre for the hectare would cause many difficulties in the spheres of farming, land management, and some branches of the legal profession (both units will be shown). In any case, outstanding commitments make it unlikely that we shall have exclusively metric O.S. maps until well after 1980. After all, although the conversion of bench mark lists to metric equivalents is easy, 10 metre contouring ideally will necessitate yet another survey of the country (or at least a recalculation of all field data).

The next few decades are likely to produce even greater confusion concerning the topographical maps we use. However, since most of our cave surveys do not present the same conversion problem, it should be relatively simple to reproduce their linear scales and grid co-ordinates in a metric form. Ideally, of course, cave surveyors ought to begin using metric Fibron tapes. No doubt the Mendip Survey Colloquium will have something to say about this in due course.

Reference

Sexton, F.M. "The Adoption of the Metric System in the Ordnance Survey". *Geographical Journal* Vol. 134 Part 3. (September 1968) pp.328-342.

METRIC DATA CONVERSION TABLE

Quantity	Imperial units to Metric (SI) units	
	Imperial unit	SI equivalent
Length	inch	0.0254 m
	foot	0.3048 m
	yard	0.9144 m
	mile	1.6093 m
Area	sq. inch	645.16 mm ² (sq. millimetres)
	sq. foot	0.0929 m ²
	sq. yard	0.836 m ²
	sq. mile	2.58999 km ²
	acre	0.405 ha (hectare)
Volume	cu. inch	16.387 × 10 ⁻⁵ m ³
	cu. foot	0.0283 m ³
	UK gallon	0.004546 m ³
	ounce	0.0284 kg
Mass	pound	0.4536 kg
	pound per sq. inch	6894.8 N/m ² (newtons per sq. metre)
Pressure		16.019 kg/m ²
		1 lb/cu. ft = 16 kg/m ³
Density	pound per cu. foot	
Temperature	degree Fahrenheit (°F)	
Temperature scale	t°F	$= 5/9(t - 32)°C$ (e.g. 70°F = 21.1°C 80°F = 26.7°C 90°F = 32.2°C)

Quantity	SI units to Imperial units	
	SI unit	Imperial equivalent
Length	centimetre (cm)	0.394 in
	metre (m)	3.281 ft
		1.094 yds
Area	kilometre (km)	0.621 miles
	square metre (m ²)	10.764 sq. ft
	hectare (10,000 m ²)	2.471 acres
	square kilometre (km ²)	0.386 sq. miles
Volume	cu. metre (m ³)	33.315 cu. ft
	litre (l) (1000 litres = 1 m ³)	0.22 UK gal
	kilogramme (kg)	2.205 lb
Mass	gramme (g)	0.035 oz
	newtons per sq. metre (N/m ²)	1.4504 × 10 ⁴ lb/sq. in
Pressure		1 N/m ² = 1.5 × 10 ⁴ lb/in ² or
		1 N/cm ² = 1.5 lb/sq. in
Density	kilogramme per cu. metre (kg/m ³)	0.062 lb/cu. ft
Temperature	gramme per cu. cm (g/cm ³)	0.036 lb/cu. in
	degree Celsius (°C)	1.4° Fahrenheit (°F)
Temperature scale	t°C	$= 9/5t + 32°F$ (e.g. 20°C = 68°F 30°C = 86°F 40°C = 104°F)

OF PITCHES AND USEFUL LADDER LENGTHS

A year ago Peter Cousins wrote a report (W.C.C. Jnl. 116, Vol. 10. April 1968) in which he rationalised the longer rope lengths used by the Club to 80', 120', 160' and 240'. His arguments were based on a frequency table of recorded pitch lengths in this country published earlier (Spelaeologist 2, 7, June 1966):

Ladder Length	10	15	20	25	30	35	40	45	50	55	60
% of Pitches	2	7	10	12.5	10	7	7	4	7.5	2	5
Ladder Length	70	80	90	Over 90							
% of Pitches	3	8	3	12							

In a letter dated 29th April 1968 he makes further observations concerning optimum lengths for electron ladders, viz.

"The reasons chosen by various clubs for their standard ladder lengths are many. In the case of the Shepton Mallet Caving Club for example lengths of 10', 20' and 35' were selected since combinations of these will give any above 30' in 5' intervals. However, the writer feels it is not economic to use several short ladders on medium length pitches, as the Shepton system can often entail. Much of the cost of a ladder is in the end fixings. Alternative systems, such as entirely 25' lengths, are clearly arbitrary and of little practical value. With this in mind I attempted to analyse the relative numbers of pitches of any length in this country. The table (above) is heavily biased in that only a small proportion of the pitches are outside Yorkshire, and clubs in that area tend to report pitches in multiples of their own standard ladder lengths anyway, even if this leaves 10' on the ground in some cases.

"The apparent minima at 45' and 55' may be the result of inaccurate reporting, but this hardly matters as 5' is reasonable wastage on any pitch. In fact, the above figures represent the number of pitches which can be climbed with a ladder of that length; in practice, 20' implies a pitch between say 18' and 23' for example. An immediate conclusion to be drawn from the table is that a 10' ladder will hardly ever be used alone, whereas one of 15' would have a much more useful life. As it would seem unnecessary to have 20' lengths as well, the 20' and 25' groups (representing almost a quarter of all the pitches) could be covered by 25' ladders without undue wastage. Thus 25' appears the obvious second length. While similar reasoning might be used to argue for a 35' ladder as the third size, further reflection, on the number of 40' pitches and the just significant peak at 80' (rather than 70'), suggests a 40' ladder to be more useful. The final choice may rest with the greater bulk of a 40' ladder relative to one of 35'. However, for the writer's money optimum ladder lengths of 15', 25' and 40' seem the best."

This concentration upon lengths up to 40' is underlined by a detailed graphical analysis of pitches recorded in the current "Dalesman" caving area guides by David Drew. His observations dated 25th April 1968 are:-

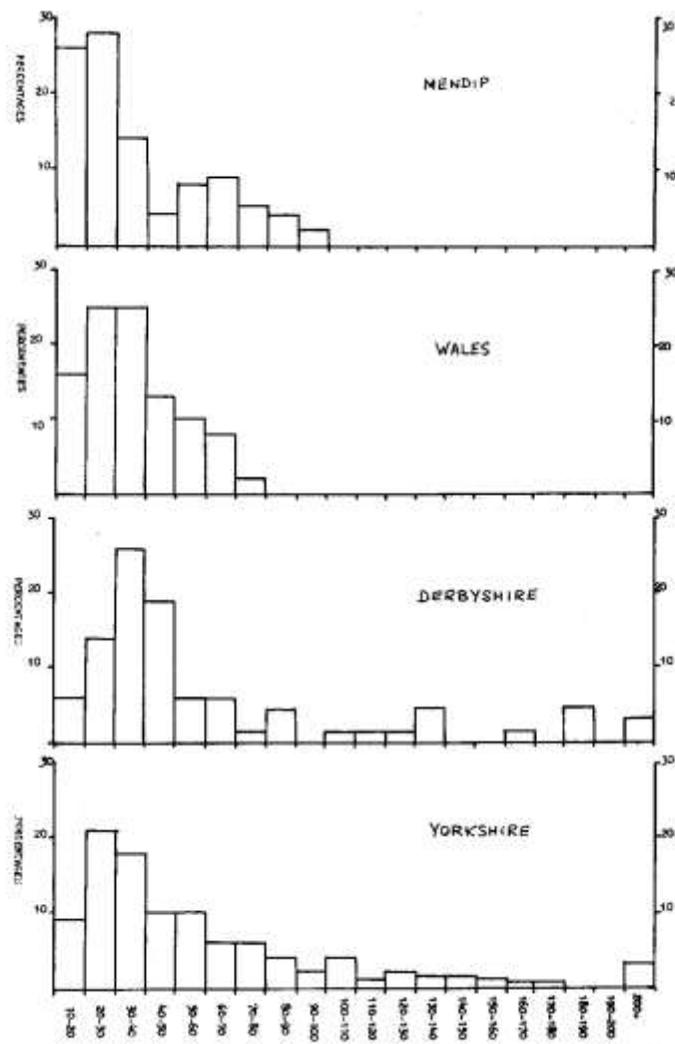
- "1. "The figures (p.281) show the percentages of the total number of pitches within ten foot divisions for the four main caving areas. The data has been taken from "Pennine Underground", "Caves of Wales and the Marches", "Caves of Derbyshire", and "Caves of Mendip".

"2. The resulting graphs are really geomorphologically relevant, and the frequency distribution is presumably a reflection of local geological and structural conditions.

"3. The commonest occurring pitch lengths are:-

Yorkshire	20'-30'	(21 %)
Derbyshire	30'-40'	(26%)
Mendip	20'-30'	(28%)
Wales	20'-40'	(50%)

"4. The Derbyshire distribution is relatively uneven due probably to the abundance of mine shafts of assorted lengths. The other regions show fairly regular patterns, the great majority of pitches being under 40'; Yorkshire 58%, Mendip 72%, and Wales 79%. Mendip has two distinct maxima at 20'-50' and 60'-70'."



MENDIP NOTES

by Schizomycetes

Invasion of Burrington, or just a sign of the times?

On the occasion of the Limestone Geomorphology Conference field day (see W.C.C. Jnl. 121. Feb. 1969), a remarkable sight greeted the motley array of "academics" casually anticipating the morning's work in Burrington. Arriving with all the impedimenta of a major expedition came two army trucks, from which spilled a tense crowd of about 40 cadets. Each was clad in incredibly "bulled" boots, identical denims, and virgin white oversized helmets. To barked unintelligible orders from a larger version of these apparitions, the rest resolved themselves immediately into two perfectly parallel ranks. Further orders echoed to and fro across the combe, and, to the astonishment of the speechless bystanders, shining carbide lamps were slotted into place as of one man. Then followed an inspection of the troops; a comment here, a "chin-up fellows" there, and suddenly a startling "Left wheel, quick march!"

With set faces and stiff upper lips our future officers and gentlemen stride out purposefully to strengthen their characters and improve their initiative down Goatchurch - already packed from Entrance to Drainpipe with school parties endeavouring to achieve similar objectives. Past the base camp of an intrepid party (making an assault on the bottom of Sidcot Swallet with the aid of telephones, complete kitchen, recorder, etc.), and we lose sight of the "thin red line" bravely mounting the scree. Who was the visiting Yugoslav geomorphologist who photographed the might of the British Army? Really, we must have better security. What on earth do the Karst Police think they're doing?

A Foothold in Wales

During the early part of the year rumours filtered across the Severn Bridge that a Welsh Regional Caving Council, similar to the Southern Council, was to be formed. The rumours proved to be true. In January, a meeting of the parent Cambrian Caving Conference was convened at Penwylt to launch the Council. The draft constitution contained several controversial clauses, not the least being the restriction of membership to clubs whose major interest was in Wales, and who were not members of another regional council. Since this would limit membership effectively to Welsh based clubs, those from elsewhere, but who nevertheless caved in Wales frequently, would have no representation. So, the morning of the conference saw representatives present from the B.E.C., S.V.C.C., U.B.S.S., and The Wessex. Accordingly the opening session of the meeting could be described as "tense". After an hour of rather circular discussion, the delegates of the Cambrian Conference agreed to allow the visitors a vote - if they had a major interest in Wales, or owned a hut there. This was a welcome relaxation of the draft rules.

Each visitor then was requested to justify his club's claim for membership. The U.B.S.S. pointed out that they had discovered Little Neath River Cave, and were doing further work in the area. Despite a few dissensions they were duly voted-in. Next came the Severn Valley C.C., who stated that they had a hut in South Wales, and so were elected. Then the B.E.C., who justified

their claim on the digging done in the Chepstow area and Roman Mine, were accepted. Finally, The Wessex pointed out that many of their members lived and caved in Wales, and that the club was making a high grade survey of Agen Allwedd under the direction of Denis Warburton. The latter reason was very nearly disallowed (on the grounds that the surveyors entered the cave with the Chelsea S.S. key, so wasn't the survey really a Chelsea one?); but, after the uproar had subsided, we were duly voted-in.

At that point the tension lifted and the meeting, which was excellently chaired by John Osborne, got down to threshing out the constitution of the Cambrian Caving Council. Eventually, one similar to that of the C.S.C.C. was drawn up, open to all clubs who could justify a major interest in Wales, and agreed. Now all the caving districts in England and Wales have regional councils who will be able to meet at a national level.

Swildons VII to XII

The last major section of Swildons unvisited since the floods of July 1968 was the streamway from VII to XII. This was remedied by Pete Standing (U.B.S.S.) and Tim Reynolds in February. The first obstruction was met at Sump V where it was necessary to lay lines from Buxton's Horror to Swildons VI. It is emphasised that these lines are guides only, and that Sump V should not be free-dived because one section is 40 feet long and the belay is not good. Few changes were noted in VI, although the original guide line at Sump VI was buried under gravel.

There was ample evidence that Swildons VII was flooded to a height of 50 feet above the normal streamway, and that a strong flow had cleaned out Sump VII to make it more commodious. In VIII a ladder which had been hanging down a short drop had been swept back over the top by the force of water. Very little changes appear to have taken place in IX, X, or XI, though Sump XI seemed choked as water had used the bypass 30 feet above the streamway. Little damage seems to have taken place in XII, but Pete Standing, who climbed up Victoria Aven reported that water had risen 50 feet at that point. Meanwhile, Tim Reynolds had a quick dive into Sump XII but could find no way on. However, he optimistically acknowledges that it would repay a closer look.

Go down a cave - at 0.6d a foot!

Your Scribe was rather shaken out of his normal routine by reading a document which informed him that, if he wanted to descend any of the caves on Lord Weymouth's side of Cheddar Gorge, he would have to write to the M.N.R.C. In turn, they would require him to sign a blood chit, and pay 1/- for each cave visited. A permit would be issued entitling him to go down the cave of his choice. No, this is not an elaborate April Fool's joke, it is a fact! Seemingly this restriction is the brainstorm of certain M.N.R.C. members, who have acted without even fully consulting their own committee, yet alone other clubs on Mendip.

The caves concerned are; Cooper's Hole, Great Oones, Long Hole, Sayes Hole, and amazingly Reservoir Hole and Totty Pot, hitherto being actively dug by Willie Stanton et al and Chris Hawkes respectively. Neither were consulted! Quite apart from the incredible lack of interclub co-operation in "the deal", your Scribe fails to see how it will work since the caves involved are

ungated.

Some control of the caves here may in fact be necessary, but for goodness sake let's have a more workable arrangement with the backing of all the clubs in the area.

Mendip Caving as it really was

On Monday 3rd March the U.B.S.S. closed its series of Spring lectures with "reminiscences" by Dr. E.K. Tratman on "Early Mendip Caving". The Geography Lecture Theatre was packed, visitors probably outnumbering "Spelaeos". Surely a fitting tribute to one of Mendip's best known, and happily still active, cavers.

Taking as his text some of the less enlightened phrases in Peter Johnson's "The History of Mendip Caving", he graphically recalled the problems of the pioneers in even getting to the caves let alone down them. An arduous cycle ride or tedious train journey was the only way to reach Mendip in the "Twenties, and all tackle had to be man-handled en route. Once on Mendip it was necessary to be very diplomatic with a religious farming community not at all in favour of young men taking recreation on The Sabbath. Many layers of heavy clothing were required, helmets were unknown, and candles by the score were the only source of light. Indeed, getting out of caves without lights at all was a frequent event, and a carefully practised precaution for emergencies in the absence of rescuers. Many of today's so-called "tigers" would be put to shame by the incredible length of these early trips with such minimal resources. And, as for those appealing to be rescued as exhausted after but a few hours in Swildons, dare we ever again make condescending remarks about the ability of our predecessors!

Dr. Tratman described and illustrated the early work in Read's Cavern, Read's Grotto, Aveline's, and Tynning's Farm Swallet, and gave his audience a clear picture of caving with H.E. Balch in Swildons. Not content with Mendip, an early trip to Derbyshire was recalled. In order to get rid of the guide in one cave the party, at a pre-arranged invitation of, "Let's all play bears!" put out their candles, and started to crawl around growling - much to the amazement of the guide, who fled unnerved.

To prove that old cavers never really hang up their helmets, Mendip's most senior club, the M.N.R.C., arranged an "old-timer's" trip down Lamb Leer last February. Using a bosun's chair to descend the Main Pitch, a large and distinguished concourse of cavers were able to revisit the scene of their youth - and to star on regional television! Among the party were Harry Ashworth, Jack Duck, and Earl Waldegrave.

Thefts on Mendip

It was with a mixture of sadness and anger that your Scribe heard of the theft of about £21 from members of the B.E.C. on a Tuesday late in February. For about six months Dave Irwin and colleagues have been running regular Tuesday evening digs to the Dining Room in St. Cuthbert's. While they were underground person(s) unknown entered the Belfry and removed all the money they could find from their clothing. Clearly, it is a great condemnation of a few of the present generation that forces the majority of honest cavers to wander around with a bunch of

keys like jailors to ensure that no one can mistake his possessions for someone else's.

Soon afterwards the electric slot meter at Hillgrove was rifled, as reported in Club News in this Journal.

B.E.C. Caving Report No. 13. - St. Cuthbert's Swallet

This comprehensive survey of St. Cuthbert's is due to be published later this year. It will be available as a complete Report or in convenient parts. Write to Bryan Ellis, "Knockauns", Combwich, Nr. Bridgwater, Somerset, for full details and prices.

LETTERS TO THE EDITOR

While a guest: Hillgrove H.Q.,
Wessex Cave Club, Priddy.
January 7th 1969-

Dear Sir,

I refer to the W.C.C. Journal of December 1968 in which the results of water-diving in the Wookey Hole-North Hill area are described and a large master cave predicted.

Earlier work, using air photographs to map surface features relevant to geomorphological studies of different terrains including karst districts, has led me to investigate satellite photographs for evidence of subsurface structures. On these I find convincing indications of deep cave lineations, especially when different filters are used. Recently, in America, I had the opportunity to examine certain plates of The Mendips, and I recall distinctly several "images" which I now realise closely match the configuration of the "divined master cave". These were quite outstanding in the Lower Pitts Farm area.

Further substantive evidence from other satellite "scans" would be desirable of course to predict the existence of concealed voids with precision; but, coupled with my observations that last July's flood water sank below The Narrows of Ebbor Gorge, the stimulus for concentrated exploration in the area need hardly be stated more clearly!

Yours etc.
G.T. Crummock, D.Sc.

Bairro Nunes,
Grandola, Portugal.
27.2.69.

Esteemed Sir,

Among the many remarkable facts of Mendip hydrology recently discovered and described by Dave Drew, Tim Atkinson et al (W.C.C. Occ. Pubs. 2 (1,2)), one of the most striking is the range of speeds at which waterborne spores have moved from swallet to rising. It seems that differences in stage during the various runs were not too extreme to invalidate comparisons of

flow rates, for the authors draw conclusions from a comparison of East Mendip rates obtained in 8 separate runs.

With few exceptions, the East and Central Mendip streams were shown to travel underground at mean speeds of 500-900 feet per hour, which is roughly what the caver who is used to accompanying them would expect. The faster rates were thought, with reservations, to suggest open, unobstructed, dominantly vadose passages in the unknown regions, a hypothesis that led to enthusiastic digging at St. Cuthbert's sump.

However, the results from Burrington have highlighted a trend that was emerging earlier, that could lead to a different interpretation. Whereas the slowest rates for uncomplicated through routes are shown by two of the largest streams. Swildon's (430 ft/hr) and Stoke Lane (550 ft/hr), certain tiny insignificant trickles whisk along underground so fast that most cavers would not keep up with them, were they traversing an average Mendip cave passage. The trickle in Ubley Hill Pot travels at more than 2800 ft/hr to Rickford (assuming that the "more than" symbols in Table 3 of 2 (2) really means "less than", and that in Ellick Farm Swallet goes nearly as fast to Langford. In East Mendip, the fastest simple streams are the little ones in the west.

Hydraulic gradient obviously has a bearing on flow rate, but the mean value, swallet to rising, is often irrelevant in this connection, since much of the fall occurs just inside the entrance as the stream drops as quickly as it can towards the dreaded "water table". In the case of the tiny trickles, a more important factor must be lack of obstruction, for a single large pool, canal, sand choke, or wide pebbly passage would prevent the express run-through that is proved to take place. Is it not possible that these trickles follow for much of their route a closely confined extremely narrow conduit, after the fashion of a hosepipe? The lack of space would result from the inability of such underpowered flows, even in flood, to open a larger way, or to prevent any roomier sections from silting up. (In fact, the spore diagram for Ubley Hill Pot shows the bulk of the wee mites coming through with the initial pulse, as would be expected of the hosepipe effect). Conversely, the slow flow rates of big streams may, as the authors point out, be explained by the presence of large volumes of semi-static water held up behind gravel banks or filling scoured-out deeps, reflecting the force of a big stream in flood.

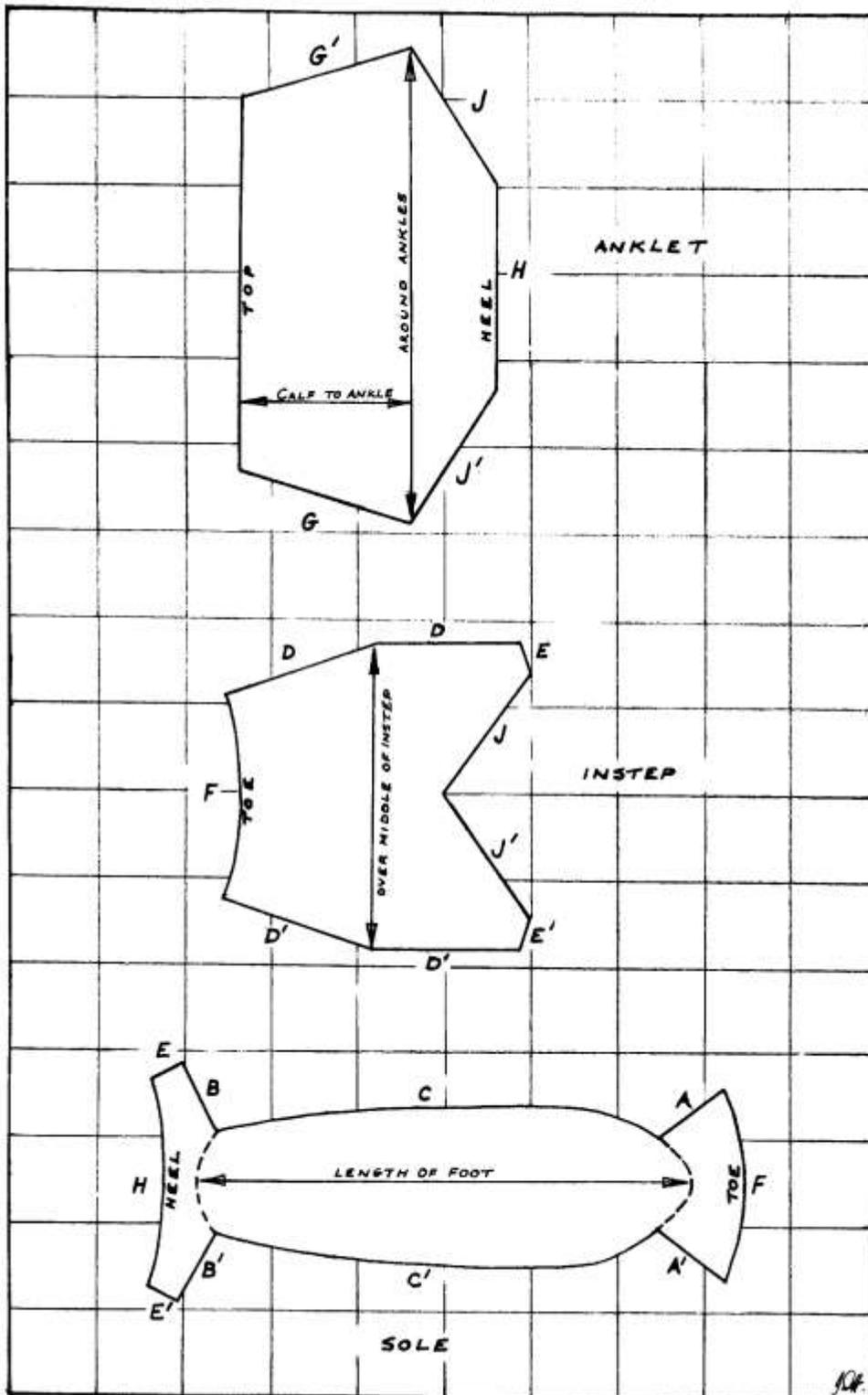
My purpose here was to suggest a possible explanation, in view of the author's regal silence on the matter, for the extremely fast flow rates of certain small streams - i.e. that after completing their initial steep descent they are too underpowered to keep open more than a tiny hosepipe-type conduit. Stated another way, the larger the stream, the greater to an unknown power its scouring action in flood time, hence the greater the volume of semi-static water under normal conditions, hence the slower its flow rate. The implications for cavers, if there is anything in this admittedly nebulous hypothesis, are obvious. Once an underpowered system has been followed down to what Balch used to call "saturation level" there would be little hope of extending it further by digging, unless there is a chance of joining a major streamway. Moreover, high-level distributaries at older "saturation levels" in such systems would be equally impenetrable.

Even the present-day flow rates of large streams should be considered in the light of recent history; for example the fast rate of St. Cuthbert's could depend on the quantities of buddle-washings that must have entered the system and perhaps caused abnormal silting beyond the

sump. At Swildon's, Eastwater and Longwood the normal flow has recently been reduced by boreholes or other means of abstraction, but the flood time flow has been little affected.

One could elaborate at tedious length on the further implications of this hypothesis, but I prefer to be cautious and wait for its rejection or otherwise by the ingenuity of Tim Atkinson and his princely retinue. If I may end, Sir, on a retrospective note, the divergence of a stream underground so that it could theoretically feed two risings has long been known in Eastwater, and another case has lately been reported by Roger Stenner from St. Cuthbert's, where part of the main stream apparently seeps through gravel to reach Cerberus Pool, from where it flows along the fault in the opposite direction to its parent (Belfry Bull. 22 (5) p72). Indeed, it seems that as long ago as the middle of the last century a stream in a lost cave near Blagdon could be diverted from one rising to another by digging away a sand-bank (this Journal, 7 (84) p54. Perhaps, then, we should not have been so surprised when the phenomenon of one stream feeding two risings was first established on Mendip 2 or 3 years ago. If, as seems probable, the disposition of fill material can make or break a through route, one might expect a few changes when underground topography is dramatically altered by floods such as those of last July.

Yours sincerely,
W.I. Stanton.



Pattern for a wet suit sock (for assembly see instructions in text). The above drawings are reduced to a quarter of their actual size, and represent an approximate size 10 sock. Convenient foot measurements have been included as a guide for other sizes.

WET SUIT SOCKS – A NEW PATTERN

by P.R. Cousins

Cavers have been using foam Neoprene 'Wet Suits' for over seven years now, the early designs being much used in South Wales during the exploration of Ogof Ffynnon Ddu and later Agen Allwedd. So far as the writer is aware only the original simple pattern ¹ has been used on professionally made suits; and only recently has another design appeared in caving literature ². This is understandable since the only other users of 'full' wet suits (divers) normally wear fins and do not subject their socks to the hard wear of boots.

The pattern shown on p 289 was the result of an attempt to design socks with a 'one piece' sole, i.e., without a seam down the middle. Also it conveniently avoids seams on the heel and toe where strain often occurs. The original pairs were made from 3/16" Neo-Nylon stuck with S.A.P. adhesive and sewn with 0.1 mm Nylon thread: they are wearing well. The pattern shown is for size 10 feet, approximately.

References:

- 1) L.S. Galpin A 'wet suit' for caving, part II. C.R.G. Pub. No. 11.
- 2) R. Whitley Putting one's best foot forward. Newsletter Vo. IV. No.3. (Exeter Univ.S.S.)

Assembly Instructions

- 1) Turn up toes on heels, STICK A,A', & B,B' to C,C' respectively.
- 2) Insert bridge pieces STICK DD, & D'D' to C,C' respectively.
- 3) STICK E to E, E' to E'; and F to F.
- 4) Start on leg piece, STICK G to G.
- 5) Attach to foot, STICK H to H.
- 6) Finish last seams, STICK J to J and J' to J'.

ON GOING TO THE BOAT SHOW

by P.R. Cousins

Cavers and Potholers have always borrowed most of their equipment from that used by kindred pastimes and occupations, and the modern caver is no exception. Our boots, with tough soles and steel toecaps were designed for use in Quarries and Mines. Likewise our helmets, which now appear on many surface construction sites. NiFe lamps come not only from mines but also from ships of H.M. Navy, where they are used as bilge inspection lamps. But, it is probably from the activities of Climbing and Sailing that we get most of our expensive gear.

In recent years a growing number of cavers have concluded that ropes designed for, and used by climbers are not necessarily the best for use underground. Our requirements and conditions of use are somewhat different to that of climbers, and many potholers would now consider that ropes for underground climbing (and more especially prussiking) should be a separate item in their clubs tackle inventory. So, while at the 1969 Boat Show this January I took the opportunity not only of visiting the rope manufacturers' stands, but also of investigating other equipment.

For several years The Wessex have been using pulley blocks designed for large, ocean going, yachts. Many firms now market this type of block; having a "Tufnol" (resin bonded fibre laminate) sheave and cheeks, with a Stainless Steel "axle" and straps. I was pleased to hear that Messrs. Gibb Ltd., were aware that their blocks had been used underground. Further, they say that their very reasonable prices (between 30/- and 50/- for caving sizes) will not be increased this year.

Occasionally there occurs a need underground for a pump to empty static sumps, or pools in digs. Several firms were showing Bilge pumps designed to handle all the detritus that accumulates down below in a ship, and many of these would also handle the grit and silt that we encounter underground. I particularly liked those made by Messrs. Henderson Ltd., which were demonstrated pumping some of this rubbish. Operating on a 1½" hose with a 15 foot suction and delivery head at over 10 gallons per minute these are better than a hand bucket. The pump can be opened for cleaning by moving a lever, though corrosion should not occur in the Neoprene rubber, glass fibre resin, and Aluminium alloy construction. When bolted to the wall or floor the simple 15" operating handle should be easy to work. Prices are from £10 - £15.

Finally to ropes. Both British Ropes and Marlow Ropes Ltd., were showing a wide range of fibres and rope types intended for sea and general marine use. In particular, Polypropylene is now available in four different yarns, the following table giving their respective trade names:-

	Marlow Ropes Ltd		Marina Brand*
POLYPROPYLENE	Name	Colour	Colour
Continuous Multifilament	Ulstron	Green	White
Continuous Monofilament	Hardy	Yellow	Blue
Staple	Nelson	White	White
Fibrillated Tape	Sturdee	Yellow	Red

Note * Marina brand ropes other than Ulstron (which is the patented brand of the yarn) are apparently known by the yarn names (listed in left hand column). Ropes sold under the

'Viking' brand are similar except that Ulstron is Green. Both Marina and Viking Ropes are made by British Ropes Ltd. Staple polypropylene yarn bears the trade mark 'Spunstron' and some ropes are also known by this name.

In addition both firms market braided ropes, and since these are nonrotating they should be ideal for abseil/prussik pitches. All but the smallest are formed from a braided sheath covering a braided core, each taking about half the load. The British Ropes "Braidline" range are mixed versions; a polypropylene core with a 'Terelene' sheath, which has less stretch than the pure polypropylene type. The most recent (as yet unnamed) all Terelene braid has the extremely low extension properties desirable for prussiking. Unfortunately, it has not yet proved possible to incorporate high abrasion resistance in the sheath by using monofilament or fibrillated film yarn. These braided or multiplatt ropes are often designed to distribute any load evenly between sheath and core unlike the Nylon/Perlon Kern-Mantle construction where the sheath is not load bearing.

Since the subject of ropes for prussiking has not yet been extensively covered in literature, anyone interested should contact the manufacturers for further details of these ropes and advice on their use.

References:

Cousins, P.R. Double Lifelining Underground. Journal of Devon S.S. No. 96. (July 1966).
Solari, F. The Rope in Caving. Proceedings B.S.A. No. 6. (September 1968).

Manufacturers' Addresses:

M.S. Gibb Ltd.	Clock Tower Buildings, Warsash, Hants.
Marlow Ropes Ltd.;	Marlow House, Lloyds Avenue, London E.C.3.
Henderson Pumps Ltd.	38 Medina Road, Cowes, Isle of Wight.
British Ropes Ltd.	Hope & Anchor Lane, Charlton, London S.E.7.

BOOK REVIEWS

The Caves of North West Clare, Ireland by The University of Bristol Spelaeological Society. Edited by Dr. E.K. Tratman, 256 pp. 32 plates, 55 maps and diagrams bibliography and index. Published by David and Charles, Newton Abbot at £6 (or £5.5s.0d. if purchased before 31.12.69.).

I suppose that one could say, taking a jaundiced view, that there is very little new in this book, that has not already appeared in the Proceedings of the University of Bristol Spelaeological Society, since Volume 6. However, since a set of Proceedings from Volume 6 onwards would cost (assuming that they are still available) over £10, it will be seen that this book represents quite good value for money.

This book is unique in that it presents for the first time in this country, a complete study of an area and its caves in depth and detail. In the course of 17 years the U.B.S.S. have discovered, explored and surveyed nearly 35 miles of wet and often dangerous cave passage, all within an area of 50 square miles in North West Clare.

For the purpose of this review this book may be conveniently dealt with in two parts. The first part deals with the history, geology and geomorphology of the caves in the area. The first chapter entitled "Mainly Historical" is just that and begins with the first recorded exploration of a cave in County Clare - that of Dr. Charles Lucas in 1736, although even he records that he was not the first cave explorer. Many other pioneers are mentioned right up to the present day. Apart from the usual risk of exploring stream passages liable to flooding, another hazard is mentioned, that of belligerent farm animals, especially bulls, who appear to resent cavers crossing their territory.

Because of its combination of geological simplicity and youthfulness North West Clare deserves to become a classical area for the study of caves. This is borne out in the chapters on the geology and geomorphology of the area, particularly in the chapter on "The Geomorphology of the Caves" which shows them to be of the simplest imaginable cave passage layout. A study of the surveys shows that the majority of the caves are basically long streams fed by tributaries. In some cases the cave may consist of only a single passage and a few tributaries, whilst in others a complete river system may be explorable. This difference is really only one of degree. The type of cave encountered in North West Clare indicates in most parts a two stage history of formation; first the evolution of phreatic type bedding plane passages, followed by a vadose stage, which introduced down cutting and meandering canyon passages in the floor of the bedding plane. The latter stage being the one which is still continuing today. Associated with evolution is the age of the caves in this area. Because of the absence of post glacial fill the caves are considered to be post glacial i.e. less than 20,000 years old, this theory is confirmed in the following chapter on "Limestone Solution" by a series of calculations based on the present day solution rates of limestone.

The second part of the book is mainly composed of cave descriptions, and this is the section that will undoubtedly appeal most to the cave explorer. Space does not permit a mention of all the caves but it is sufficient to record such systems as Poulmagollum - Poulelva over 7 miles long, closely followed by the Doolin Cave system which is 6½ miles in length.

Whereas Poulmagollum-Poulelva was known as early as 1880, Doolin dates from 1953 and is probably one of the most spectacular discoveries the U.B.S.S. has made in the whole of Clare.

Possibly the earliest cave to be visited is that called the Cave of the Wild Horse in 1736 (referred to earlier). The original description is printed, in full, together with its modern counterpart.

A point which is made time and time again is the danger of flooding. By their very nature most of these caves are liable to flood to the roofs in wet weather, sometimes in less than an hour! It is with this in mind that one turns to the surveys, over 20 of them many being the “pull out” type.

They represent literally thousands of man hours of work in wet stream passages, work that was often curtailed or abandoned due to flooding. The actual form of the caves makes the draughtsman's job more difficult. Nearly all the caves are basically long passages in a single direction, with little width, and if drawn out at such a scale to show passage widths, the plans, in many cases, would be over 30 ft. long. Hence in the majority of cases the passage is shown as a thick line and the sections are drawn on a scale which is usually 10 times larger. This gives a fair indication of the cross section of the passage at certain points, but it is still necessary to frequently consult the text as the section only gives a general indication of passage size. My main criticism of the surveys is that the entrances are seldom marked, warranting further perusals of the text. Changes in floor levels could also be given so that another perusal of the text does not have to be made to ascertain the depth of pitches etc.

The concluding chapter is on Place Names, an important subject when most names have a geographical meaning e.g. Poulmagollum - Hole of Doves and Knockauns - Little Hills.

The Appendix contains sections on Cave Surveying, Tracing Underground Water Routes, List of U.B.S.S. Members and the years they went to Ireland, Details of Unpublished Accounts and a List of Map References for the caves. The latter section shows that most of the caves can be located on Sheets Nos. 4 and 6 of Clare 6" O.S. Map.

Mention must also be made of the excellent Bibliography of over 192 items covering many languages, but all having one thing in common - they all refer to the caves of North West Clare.

In summing up there are plenty of cave descriptions, backed up by surveys and photos, plenty of pointers for further exploration, either literary or in the field, and this book is a must for all those going to Ireland.

A.D.O.

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Recherches sur les Grottes du Banat et d'Olténie (Roumania 1959-1962), Part 1, Grotte du Banat, Explorées de 1960 a 1962 by L. Botoşaneanu, A. Negrea, Şt. Negrea in collaboration with E. Balogh, Val. Puşcariu, T. Rusu, V. Sencu, I. Viehmann. Part 2, Grottes d'Olténie, Explorées de 1959 a 1962 by Anca Decou, v. Decou, M. Bleahu. Preface by A. Vandel, (Member of the Institute) and Introduction by C. Motaş and Val. Puşcariu. 396 pp. 46 plates, 129 figs. bibliography., Published by the Centre National de la Recherche Scientifique, Paris, 1967 at 100 French Francs (£8.9.0. approx).

With the advent of fast and cheap forms of travel, holidaymakers, including speleologists are looking further afield nowadays in search of an exciting and different vacation. It is therefore not surprising that Rumania is becoming more and more popular amongst cavers, especially when one realises just how much of this land is pitted with caves and potholes, of spectacular dimensions, most of which are only known to a select handful of specialist biospeleologists who work at the Emil Racoviţa Institutes of Speleology in Cluj and Bucarest.

One of the reasons why Rumania has not been popularised by cavers before is the lack of information on the caves which has been available. Most published information has been on Biospeleology (a field in which Rumania must surely lead the world), and these publications have either been obscure with little cave references, or in Rumanian which is not a language which is widely understood in England.

It is for this reason that we must hail the advent of this new book which is in French, and so explicit that it may be readily understood by many Englishmen, even if their French is only of 'O' Level schoolboy standard.

This tome describes scientific research undertaken between the years 1960-62 in the caves of the Banat region, and in the caves of the Oltenie region between 1959 and 1962, by groups of distinguished Rumanian speleologists.

There has been much Franco-Rumanian collaboration in the field of biospeleology since the time when Racovița and Jeannel worked so closely together before the First World War over 60 years ago.

The Rumanians have now followed the example of France in opening an underground laboratory in the caves of Cloșani in Oltenie, and international Speleological relations have been strengthened by reciprocal visits of each country's speleologists to the others laboratory.

This work is another example of Franco-Rumanian collaboration, for though it is about Rumanian Caves it is written in French and has been printed and published in France under the auspices of the Centre National de la Recherche Scientifique.

The regions which are dealt with in this book are possibly some of the most interesting karstic phenomena in Rumania, and as such many of the caves therein are scheduled, not only by the Speleological Institute, but also by the Commission for the Protection of Natural Monuments. The protected sites include: The Caves of Comarnic, Popovăt, Muierii Baia de Fier, Gura Plaiului, Cloșani, din Cioaca cu Brebenei, Topolnița (the longest cave in Rumania) the natural bridge at Ponoare, and the Gorges of Caraș and Nera.

The book has been divided into 2 sections, the Caves of Banat and the Caves of Oltenie. About 100 caves and potholes are mentioned in each section, and the information has been classified thus:

1. Name, 2. Other Names by which it is also known, 3. Bibliography, 4. Date of Exploration, 5. Directions for finding the cave, 6. Dimensions, 7. Description, 8. Infill, 9. Speleogenesis, 10. Climatology, 11. Trophic Resources, 12. Biospeleology, 13. General (palaeontology, prehistory, etc. are included in this section).

There is also a survey of each cave, most of which are very detailed, and an explanatory key which translates labels and signs on the surveys from Rumanian to French. This is most useful as it not only facilitates the reading of surveys in this book but in other books written in Rumanian.

There is also a Glossary of Caving Terms in Rumanian-French, and a guide to Rumanian pronunciation.

Each section begins with a general account of the geology and geography of the area and the caves have been divided into areas within each section. Explanatory maps are also supplied.

The work is completed by a series of plates of some of the various caves mentioned, together with pen and ink drawings, explaining interesting features such as the geology of a particular area.

When one considers just what a small fraction of Rumanian karst is covered by this book, it is obvious just how much detail is contained within its covers. The authors are to be congratulated for compiling so detailed and exhaustive a treatise which should serve as an example to other countries engaged in this type of cataloguing work.

It will no doubt remain a standard work on this area for many years, indeed it is difficult to say how it could ever be improved upon.

Cavers and speleologists alike will find this book of interest, but for those intending to visit either of these regions I strongly recommend it as the information to be had is presented in such a way as to make it a most valuable reference work.

A.D.O.

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LA INCÓGNITA DEL MUNDO SUBTERRÁNEO by J.M. Armengou. 206 pp. numerous illustrations and surveys. Published by Ediciones Telstar, Barcelona, Spain 1968 at 80 pesetas (approx. 10/-d).

The *Mysteries of the Underground World* is a book more for the general public and would be cover rather than for the experienced caver. It contains sections on how to become a caver, and how to go about joining a caving club, as well as describing the equipment used underground. A list of speleological terms is given, a most useful key to some of the more technical words used by Spanish speleologists.

"The Black Book" is the title given to a chapter on caving accidents. Mercifully these accidents are comparatively rare in Spain. The only two fatalities which have occurred in recent years have been due to falling from ladders.

This is followed by descriptions of some of Spain's better known caves and potholes. A list of Spain's deepest and longest caves follows, together with a list of the deepest and longest caves in the world.

A chapter on industrial uses for caves included such diverse subjects as tourism and phosphate (guano) mining.

The book is concluded with sections on Spanish Caving Groups. Each is given a potted history and a brief resume of its work. There is a Spanish Caving Bibliography, and a few surveys of the more important Spanish Caves.

ADO

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Jusqu'au fond du Gouffre, Record du monde a la Pierre Saint-Martin, by Correntin Queffelec. 176 pp. ill. 3 plans. Pub. Editions Stock, Paris, 1968. 15 Francs (27/-d. app.) Obtainable from Tony Oldham etc.

This is the story of 16 years of endurance when man has pitted himself against nature to uncover some of her most closely guarded secrets.

Situated high on the Pyrenees, in an inhospitable karst terrain between France and Spain, Pierre St. Martin shot into notoriety with the tragic death of Marcel Loubens in 1952. It took two years and many days of hard struggling to return Louben's body to its rightful resting place in his local cemetery, and at this time Corentin Queffélec resolved not to let this tragedy be the end of an adventure, but the beginning of a new era in speleology.

Up to this time Queffélec had never been caving, but the continual pursuance of his youthful visions kept him young.

This is a true story of speleological achievement, however improbable some of the incidents may seem. The author has used his pen to give descriptive sketches of his underground companions. The style is amusing, even droll, and often colloquial.

The work is well illustrated with some exciting action shots of scenes in the cave, as well as photographs of the surrounding countryside.

The book is concluded with three plans which in themselves explain the years of work which has gone on in the cave. The first shows the system in 1960, both an elevation and a plan. The second shows the downstream discoveries made between 1961 and 1965. This took the form of a series of shafts, going down like a huge flight of stairs, and terminating in the Puits Parment. In August 1964 the survey team found themselves at a depth of 1,120 m. They were so astounded at this reading that they checked and rechecked their findings, but they were quite accurate. This did not beat the record, but as the cave continued on, they were determined to return the next year to continue the struggle.

The third plan takes up the story of the exploration in the upstream series. This series begins at the entrance of the Gouffre Tete Sauvage, and the first section is a descent down a series of shafts to a depth of 410 m. Then the cave tends to level out, maintaining a downward gradient. It was by pushing this end of the cave that the team finally managed to reach an overall depth of 1,152 m. and claimed a record.

The book is obviously written by one who has a sincere feeling for this particular cave, which itself has reciprocated by revealing some of its secrets, both spectacular and exciting. And now, through the hard work of Queffelec and his comrades Pierre Saint Martin is a contender for the record of the Deepest cave in the World.

A.D.O.

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Shorter Notices

"Speleo". Newsletter of South West Essex Technical College Caving Club. Vol. 7, No. 1 (Winter 1968)
Price 1/-

Mainly devoted to club meets and activities, but contains valuable C.R.G. Grade 4 Surveys of the North West Stream Passage, Swildon's Hole, surveyed by Trevor Faulkner and colleagues. The use of light blue grid lines with Stanton's master plan co-ordinates has a pleasing effect. An accompanying report describes the survey.

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Cave Diving Group Derbyshire Sump Index compiled by T.D. Ford, B.Sc., Ph.D., F.G.S. (August 1968).
Price 5/-. Obtainable from P.W. Kaye, 9 Broomfield Cres., Leeds 6.

A comprehensive review of sumps in 23 caves and mines of The Peak District. Three line surveys of the more complex systems are a convenient addition at the end.

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Cave Diving Group Newsletters New Series No.9. (Oct. 1968) and No. 10 (Jan. 1969).

The traditional pattern of logging dives in the different limestone regions is maintained in these issues, although the latter contains useful observations "On a perforated ear drum" by O.C. Lloyd.

Cave Diving Group Diving Review 1966-67. Price 12/6. Obtainable from P.W. Kaye, 9 Broomfield Cres., Leeds 6.

An impressive 129 page record of the growing activities of the C.D.G., at home and overseas. The clear large scale surveys included are most useful.

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Shepton Mallet Caving Club Journal Series No. 6 (December 1968). Price 2/- plus postage from B.M. Ellis, "Knockauns", Combwich, Somerset.

This bi-annual Journal is excellent value for money. Considerable thought has gone into the preparation of the December issue. Most of the articles are well illustrated, and the bulk of the publication deals with small sea caves on Lundy Island.

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The British Caver. Vol. 50 1968-69. Edited and produced by Gerrard Platten, Rotherfield, Fernhill Lane, New Milton, Hants.

A wide-ranging digest of reprints, reviews and reports in the grand tradition of British Cavers.

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Northern Pennine Club Newsletter No. 29. (January 1969)

Mainly dealing with N.P.C. business and trips, but containing an impressive list of recent Yorkshire discoveries in "Miscellaneous News". Who is the T.E. Reynolds responsible for the attractive cover? Have the N.P.C. one as well?