L. A. HOLDER

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ILLUSTRATIONS

EDITORIAL

This Journal can be likened to the instruction sheet of a Do - It - Yourself kit. It is not, in the main, a triumphant report of work begun and completed, but is, instead, intended as an inspiration to our group of horribly enthusiastic young members.

Once more, SUSS finds itself training new members to replace thos who have had their caving curtailed, for the usual variety of reasons. Those experienced members who are left are, in the main, in the middle of projects and are loath to write them up before they are brought to a conclusion. This journal, then, is not for, or of, them. Neither is it for the caver who is in the early stage of gazing, with soulful eyes, at a mass of formation, instead of cursing it for preventing him from pushing on into some even more inaccessible parts. Instead, this journal is for the person who is prepared to try something new and willing to put some work into it.

The articles on Cave Digging and Rock Climbing are especially of the "Go-thou-and-do-likewise type" and for these we are most grateful to Basil Marsden, member of B.S.A., and friend of SUSS, resident in Belgium. As there is work of this nature in the air, at the moment, these articles may well prove of value to members of SUSS and other societies.

Barbara Dew has provided us with an article on cave fauna, much against her better judgement ("I' haven't nearly finished, but I'll write enough to show what we're up to"). It is hoped that this article will spur others on to lend assistance in the work.

To all other contributors, fellow researchers, sources of inspiration and unknowing subjects of satire, many thanks. And many thanks also to our long-complaining stencil-cutter, whose delicate touch on the typewriter is so familiar to all readers of the SUSS circulars.

One apology that must be made, is for the lack of translations. End of year pressure has just made this impossible. Never mind, better luck next time.

Adrian Hunt (Editor)

CAVE DIGGING

No speleologist worthy of his title has not, at some time in his life, dug a hole in a cave, either in order to get into the system, or to bury his litter. These, however, are not what the French, who are academic in mind, call "fouille". They are simply good, old fashioned excavations, made for the fun of it, or because one was talked into making one, by someone else who should have known better.

But there are good reasons for digging in caves, and as I am one of those "types" who digs for no enchant reason, save that it's Sunday, I feel duty bound to explain myself.

Caves in Europe have been dug for nearly two centuries, by learned gentlemen in frock coats and side whiskers. They returned to their special corners with odd bones of pre-diluvial-man, and once there, they wrote long papers, which from the pen of a T.H. Huxley, are still readable, but which otherwise are long since forgotten.

These ancestors of ours, men like Spring, Schmelling, etc., have left us a great heritage, in that above all, they were seeking a scientific truth, backed by years of work underground. If their collections of old bones are smiled upon by long-haired people with their superior knowledge and University grants, they are none the less of interest to us, the ordinary cavers. Who amongst us, has not been thrilled when the massive molar of some long-dead mammoth has been placed in his hand.

I remember still, the day when a small group of us broke into a burial cave. One of us, a well known archaeologist, with a Chair in Liege University, was so "moved", that she could not light her cigarette.

It's as simple as that.

Yet a real cave dig is not just a question of digging a hole. Much depends upon:-

(a) Is it worth digging?
(b) How should it be dug?
(c) When, that is, at what season should it be dug?
(d) What is the object of the excavation?

Of these questions, the last, (d) is the outstanding one. If, for instance, the work is to clear a passage etc., then all we need is a pick and spade, perhaps a few pounds of explosive and some innocent people to do the job of removing the earth. If, on the other hand, the dig is"scientific", then in addition to the willing hands, point (a) must be studied.

When a dig is archaeological, palaeontological, or both rolled up together with some geology thrown in for good measure, the question of "is it worth while" is a big one. It is particularly so with the half-hearted, who wish to write a thesis on something or other. The only true way to find its value is to go and dig. If it is a go, no-one will ask you if you have wasted your time, Auntie will be most pleased to talk about you, and club membership will rise. If it's a complete washout, it's been good for the girlfriend's figure. The only thing that need be understood from the start, is that digging caves is hard work, needing patience and good health.

Question (c) as to what season is best, depends on the climate and when your assistants are free.

Question (b) is the major one, in that, it gives rise to multiple side issues. A serious dig can only be done by one man but he may, and often must, have several aides. This one man conception of control, exists on the great archaeological excavations, where hundreds of labourers are employed. To us, however, in a cave, the fewer big boots and the fewer foremen we have tramping about, the better.

I have found that the ideal cave team, on an excavation job of some size (a shaft 35 metres deep) is four. They are grouped roughly to cover the following trades.

(i) A director, who usually digs either with a spade or a paint brush, as the game requires, and who runs the show. He is the main labour force.

(ii) A recorder and draughtsman. (A young lady is usually suitable for this task).

(iii) A surveyor, (usually the draughtsman).

(iv) A photographer.

(v) A field chemist who can harden bones, stick pots together, make microscope slides of earth samples and brew tea at regular intervals.

The director says, "We will dig here". He then sets to, and cleans up the site. If it is a cave entrance, he shaves the site of brush etc., and, I insist, he must do it himself, so that he is sure that the earth is not disturbed. At our dig in the Trou du Romains, in Belgium, I spent two months alone in this work. It's a question of the old Yorkshire adage, "If tha wants owt doin, tha mun, alas, do it thasen".

Underground, the choice of site is not so easy. Judgement depends a great deal on experience and imagination, and even more on a sort of sixth sense. If it's man's artifacts that are sought, then man must have gone there for some reason - to live there, to make

magic, or to hide. Each of these having a different object, requires a different interpretation by the digger. If it's animal remains, then they are classable under different forms of deposit. Did the animal walk in to die? Was it dragged in by some beast of prey? Was it washed in, whole, or in part?

In the last case, then natural traps, such as the base of avens, or still pools (wet or dried up), are good places. Places where blockage may have taken place (tree jams, etc.), when some long-dry passage was filled with a roaring torrent, are to be sought after. Lakes were, and still are, major traps for future fossils. A cadaver, washed in, while rotting blows up with its internal gas and floats. The members, and particularly the jaw bones, then drop off and sink into the lake mud on the bottom. Thus cave halls, even with stalagmitic floors. may hold untold palaeontological evidence. Usually however, we find that it's like fishing, either you get something, or you don't. In any case, you always get very dirty and usually, in Europe at least, wet.

Having cleared the site, it is surveyed carefully and, if possible, a painted horozontal level is run round the wall. This is marked on the plan, and on it, sections and positions are based.

This method is old, well tried and perhaps suitable to most sites, but underground it is principally used to mark exactly, the dig itself, which usually has to be a sound or trench in the floor.

In large archaeological excavations, trenching and sounds are to be frowned upon. In a cave there is usually little room and a hole, elevated to the social standing of a sound, is alone practicable.

As the floor is not a perfect plane table, we usually mark off the site and build around it a perfectly horozontal level, with planking or, in some cases, wires fixed to corner bars driven into the cave earth. These are measured off and a system of cross wires installed, to give an open mesh, with squares of one metre.

The squares are numbered in the recorder's plan and usually subdivided, so that anything found will fall inside one of these small areas. Vertical sections are recorded, as the earth is removed from the squares. Positions of finds are also marked in these latter sections, together with data such as stones, and the "fill series" of the clays etc.

All finds and geological evidence are recorded and photographed as they are unearthed.

Microscopic sections of the earths are made at 5 cm. intervals in depth, in every quarter of every square, irrespective of what it looks like. In all special cases, several slides are made. From all squares, samples of the earth are removed for analysis, etc.

All finds are labelled, numbered and recorded at once. Bones are cleaned and treated with Vinamul as soon as practicable. If they are fragile and damp, they must be sealed in metal boxes, until proper treatment can be made, or they will warp, or fall to dust. Coprolites must be treated in a like manner.

All cave earth removed must be sieved through a ten millimetre screen, and then a one millimetre screen. Screen washing is better if water is available.

The greatest climatic evidence of past times, can be drawn from the extraction of fauna and floral remains from cave earths. Flora are extremely important.

Cave earths and even layers of stalagmitic floors, all have their part to play in the interpretation of past climatic factors. Their contained fossils only stress the evidence.

The following will give some idea of the diversity of evidence, presented by a small cave dig, made within the entrance light zone.

In 1954, Mademoiselle Monique Haidon, a Belgian member of BSA, found a small cave entrance above Petit Modave, near Huy, Belgium In regard for our friend, we therefore called the find "La Grotte Monique". A few feet inside, the cave was filled with cave earths which contained a rich fossil fauna and flora, dating back to the Pliocene and showing evidence from a good deal of the Pleistocene period of geological time. Under the entrance route, in the disturbed original fill and in the entrance-terrace earths, were Bronze Age and Neolithic remains, flints, vases, pins, etc.

What is indicated below, is a sequence of fills, as we found them, with their age and chief contents. A full report has been submitted to BSA for publication.

La Grotte Monique at Petit Modave

The fill of the cave was complete to the roof when found and consisted at the deepest part so far examined of the following layers (from the top down).

(a) Lehm or Decalcified Loess. (PG12)

1' - 2' It is loose in composition and is particularly rich in Langomys pusilus, Vulpes alopex, Ursus sp, Blue Hare etc. ...

6" - (b) Rock Fall rotted down to a stiff dolomitic powder ash.

6" - 1' (c) Sterile Soil (PGE1)

This soil is sterile near the entrance, but at the deepest part of the cave, we have found Gluton remains, smashed by soil creep.

2" (d) Rotted Rock layer (ApG12)

12" - 18" (e) Lehm

Very firm and compact, Fossils rare, include the Pika Spermaphylus ( ) Vulpes etc. ... (ApG11/2)

1" - 2" (f) Rotted Rock Layer (ApG11)

2" - 6" (g) ORGANIC MUD Extremely rich in plant debris, which is highly fragile, Fauna includes Hyaena, Ursus

First Interglacial Plants so far recognised:-

Sciadopitys sp.	, Abies fraseri
Picea excelsa	Larix europaea
Pinus haploxy lon	Pinus sylvestris
Polygonum bistorta	Lycopus europaeus
Mentha aquatica	Euphorbia palustris

12" - 18" (h) Layer of Large Rotted Rocks on Floor (EG 12)

(i) Compact Grey Mud

Between the rotted rock (h) and in the floor (bed-rock) fissures. Also in some of the roof fissures in some of the less exposed parts of the cave.

Sequence of Fills from La Grotte Monique

(i) (continued)

Fauna includes Sabre cat

Flora:-

Sciadopytys sp.	Abies fraseri
Keteleenia davidiana	Keteleenia loehri
Tsuga sp.	Picea excelsa
Pseudolarix annbilis	Larix sp.
Pinus haploxylon	Pinus sylvestris
Quercus borealis	Euphorbia amygdalöides
Euphorbia helioscopia	Tilia tuberculata

On top of the fill were found some vase fragments of the Bronze Age, and just below the surface of layer (a) a large vase fragment of Neolithic type as it resembles the Ben-Ahin vase in paste but not in form.

The importance of the plant remains found in the older layers of the organic mud and the compact grey mud, is evident, when their age is remembered. The former, by radiation dating, is roughly 500 thousand years old and the latter, 580 thousand. The Lehm, or Decalcified Loess (PG12), dates at 190 thousand years. As to the superimposed material of man's manufacture, the remains of plants (in a hearth) show the Bronze Age (by C 14 analysis) to be not more than 1400 years B.C.

The outstanding point is, that within a few short centimetres, the cave earth differs in age by several hundred thousand years. This being frequently the case and also because the same earth may contain pollen, the dig becomes so delicate that one hardly dare breathe on it, let alone swing at it with a pick-axe.

It is evident that the first-hand examination of the cave earths by microscope, should be on the site, before sieving, or removal of each cake of earth. It is also evident that fossil bone should have the soil in its hollos examined for pollen. Sherds of pottery, flints, etc. must all be treated with the same reverence . Don't rush off to clean a nice flint, or skull, the matrix of dirty clay around it probably has more value than the artifact.

It is equally impracticable to cart a full University laboratory underground, and it thus stands to reason that the cave excavation team must be very severe with themselves about sample taking.

If pollen is there, it is usually stuck together by a sort of organic glue and this is best broken down by boiling a sample of the earth in 10% KOH. I do this on the microscope slide itself. A little, a half pin-head, of the material, is placed on the slide. This in turn is flooded with a drop of the 10% KOH, from a pipette. I then hold the slide with a spring clothes'peg, over an alcohol flame, until the liquid boils. In this way the matrix breaks down and the presence of pollen is revealed. If it is there, the soil is removed in hermetic plastic bags, duly labelled, for expert examination, in the right quarter, where long-haired gentlemen and academic ladies can put it in the centrifuge and then make pollen counts, all through the winter.

If it is not there, one has done one's duty and one can therefore tell the others they may again breathe normally.

All this may seem far fetched. It is not. Cave excavation is an art, requiring time, and devotion to routine. But it pays dividends in quite a short time, in acquired knowledge and understanding of caves. Never go out with the intention of finding such and such. You never will. Just go, and something will turn up. Never take notice of the "Nothing there" people. They are less than helpful. Be cautious at all times. Never hasten. Think three times before you strike, and you will find the equivalent of the Bronze Age Vase from the Grotte Monique, presented to you by the Belgian Section of BSA, on your Tenth Anniversary, with our good wishes.

Basil Marsden.

1400-1200 B.C.

This is the rare Bronze Age vase mentioned in the article above.

It is 6" high, 9" in width, and is not, by any means, the amateurish-looking pot the drawing would indicate.

Made of fine red clay, the vase is finished in a black semi-glaze, the shaded areas representing bands painted with brown slip.

This vase lay entombed in the Grotte Monique for over 33,000 years until that cave's re-discovery in 1954 by our Belgian friends. Unfortunately, in spite of all possible precaution, the delicate pottery fell into a thousand pieces on its air journey to Australia. However, it has been faithfully restored, and will remain one of the Society's most treasured possessions.

SUSS is deeply appreciative of this fine gesture by one of our overseas friends.

THE SURVEY OF THE DRUM CAVE

This report summarizes experience gained over a period of organisation of survey work at Bungonia and elsewhere. In fact, it summarizes survey work.

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Section 1 Organization

"Anyone want to go down the Drum? ... Well we can only take eight ...Can you belay from ... Can you belay from ... Please, will you, can you, please belay ... it's only an hour ..."

"That's not a bowline ... I said it's not a ... See, I told you ..."

. . . . .

Section 2 The Equipment

"Careful with the aneroids, they're borrowed ... so are the tapes."

. . . . .

Section 3 The Survey

"Ready to start and it's only 11.30."

"You take this end of the tape John ... you read the compass ... well you read the compass then ... O.K. dammit, I'll read the compass and the abney and the aneroids ... the aneroids ... just as well, if you had, I'd have ..."

. . . . .

"So you're breathing rapidly, so what ... no air won't kill you - perhaps ... O.K., so your lamp is out ... migod so is mine - O.K., we'll go back ... after all we've practically finished this part of the cave - it's every bit of fifty feet long and the time's only 2.30."

. . . . .

"O.K. I'll go up next, it will be nice to have dinner before dark."

. . . . .

"Finished dinner and it's only 9.30, I'd best go look for Adrian, or go to bed, or something."

Appendix The Map

(Traced direct from the originals, stored in my waste-basket.)

(Owing to the effects of high concentrations of CO_2 on the surveyor's accuracy - See SUSS Journal 4 1, - the map is of such a quality that it has been omitted - ED.)

CAVE FAUNA AT WOMBEYAN

As previously reported, cave fauna is both varied and uncertain in its distribution within any group of caves. The reasons why certain animals are plentiful in some areas and scarce or missing in others, is still undecided, and should prove an interesting project on its own.

In this report, there are some notes and remarks made on the animals collected at Wombeyan during October 1959. Two trips were made to the area on 5th-6th and 26th-27th . Specimens were collected both times and a summary of the results appears below.

BATS. The bat investigations are progressing at a steady rate and arrangements are well in hand for a start to be made on systematic banding.

Bat parasites have proved very interesting, both in regard to species and numbers. Bats, as is to be expected, suffer, like all other animals, from numerous parasites, and the first detailed examinations brought to light some quite interesting data. The bats under discussion were captured in a small blind chamber in the Fig Tree Cave on the Wombeyan reserve. As is often the case at certain periods of the year, all examples found in one area of a cave were of one sex, in this case, males.

So far, 10 Miniopteris blepotis have been examined and searched for external and internal parasites and the following results have been obtained.

(1) A small fluke Gyrabascus brevigastrus (?) between 1 and 1.5 mm in length, has been found in the stomach and small intestine, All bats examined harboured these parasites, their eggs being present in the faeces.

(2) A nematode, Anoplostrongylus heydoni, from 3.3 to 4.5 mm in length, the females being larger than the males. This worm was quite common in the bats examined and, like the fluke, was also found in the intestine, but not in such numbers. This worm was originally described from the bat Miniopterus schreibersi(?) taken at Townsville, North Queensland, in September 1928. A full description, with illustrations, appears in The Annals, Magazine of Natural History, 10th Series, Vol. 6, No. 31, pp.1-5. It is especially interesting in regard to the large number of sharp spines on the bursa of the male.

(3) Blood parasites have, at present, been restricted to one example harbouring a malaria-type organism. These parasites have not been further investigated and require more study.

The external parasites consist of wingless flies, mites and ticks. To date, the only creature positively identified as to species, is the tick which proved to be a larva of Ixodes vespertilionis. This is very interesting, as it is a new record for Australia and the first time this tick has been associated with a positively identified bat. We have been specially requested to get more material and if possible, adults.

The flies belong to the Family Nycteribiidae and to date attempts to find the species has failed but work is continuing.

The final group from the bats themselves are the mites, which belong to the Spenternex group and here again no specific name has been given. The mites are usually found on the wing membranes and, on one occasion, on the tail membrane.

Although not directly concerned with bats, there are the animals found in association in the guano. Here we found another species of mite and the very numerous larvae and pupae of cave living moths. The mite concerned was bright red in colour and quite easily seen with the naked eye. To date, its name is unknown and more material is required.

The remaining fauna included a number of insects, some spiders and several mollusca. Some of these animals were obviously washed in by the river. The molluscs were ordinary garden snails and the insects included two species of May flies and a dragon fly. Both adult and larval forms were obtained of the last two.

The true cave insects consisted of cave crickets the Family Rhaphidophorinae. Both males and females were captured. It is very important when identifying insects to have both sexes as these are frequently very different and unless both are present mistakes in identification could be made. The difference between the sexes is very marked, the female having a long pointed ovipositor projecting from the end of the abdomen while the male has two short"claspers " also projecting from the end of the abdomen. (See diagrams (1) (2) and (4) on page 13).

The final group is the spiders. This group has proved very difficult and at present no one seems able to tackle the job of identification. Spiders hare found in both the twilight zone and in places of complete darkness.

Those found in the twilight zone also occur in rock shelters and overhangs, especially in the sandstone areas around Sydney. This spider makes a very characteristic web, which, in undisturbed areas, is typically funnel shaped. (See diagram, (3) on page 13).

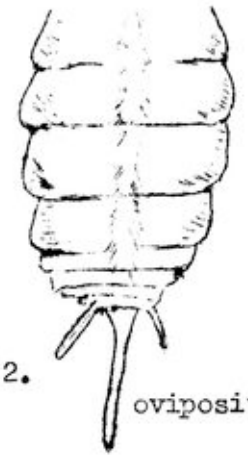
A spider very like this species is also found in the deeper parts and is probably the same species. So make a point of watching for the very typical web.

There are two other species of spider, one quite small and active, the other larger and characteristically marked with darker bars and stripes. It is hoped to get the material identified in the future. Does any member or member's friend want to become a specialist in Australian cave spiders? If so we can help him or her onto the right path.

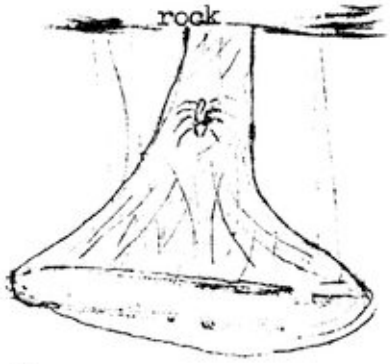
Barbara Dew

DIAGRAMS FOR IDENTIFICATION

1.



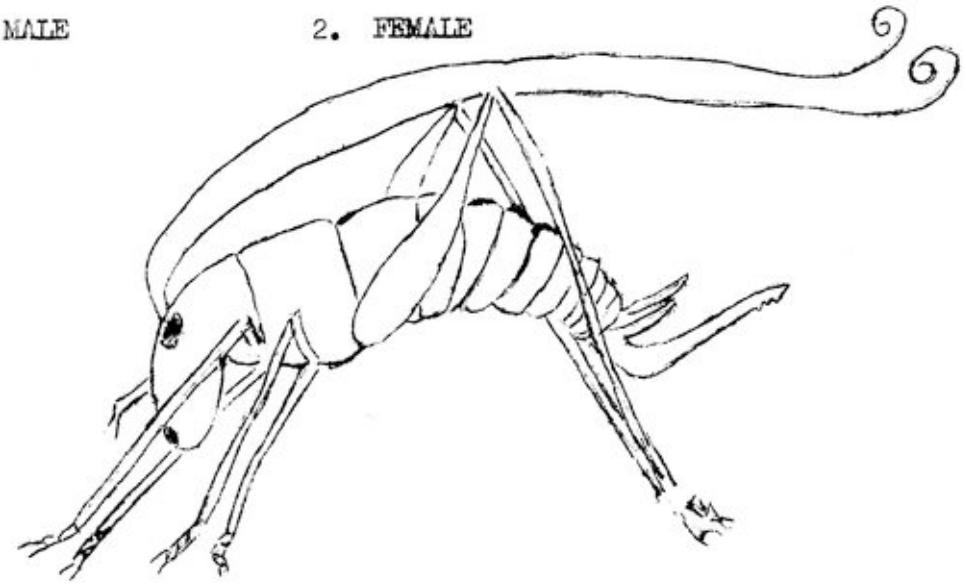
2.



3. SPIDER WEB

CAVE CRICKETS

1. MALE 2. FEMALE



4. LATERAL VIEW OF FEMALE CAVE CRICKET

Note elongated ovipositor between spines at base of abdomen.

REVIEWS OF SURVEYING PAPERS

All the papers reviewed are available in the SUSS library; several of them have been reviewed in earlier SUSS journals but are reviewed again, to make the information more readily available and more complete. A large number of papers and articles in the library have not yet been reviewed, but may be found by examining the index to the library, or by way of the bibliographies in the papers reviewed. Further information may be obtained from the A.S.F. subcommittee on Cave Survey (Organiser for 1959: R.T. Sexton CEGSA).

The most useful papers for anyone intending to undertake surveying are marked thus *

* SURVEY OF SCHOOLHOUSE CAVE - H.F. Stinson

NSS BULLETIN 12, Nov., 1950, pp.43.

(Note: This is the volume that contains the "Cavern Hymn of the Earth Planet")

Stinson gives a chatty account of the mapping, interspersed with a few useful notes on technique and a number of exceptionally good sketches by Tom Culverwell. These sketches give a clearer idea of the sections of the cave than any map or photograph, and are an invaluable addition to any report on exploration.

The plan of the cave shows relevant surface survey detail, which is of advantage in some circumstances.

The actual text is of some interest as a story of exploration.

* CAVE SURVEY - A.L. Butcher ~~Butler~~.

CRG publication No. 3, 1950

This paper is a well-written, well-presented outline of cave surveying, and is ideal as an introduction to the subject, or as a reference.

The topics treated are: Reasons for mapping, Standards of accuracy, Instruments, Surveying and Mapping procedures.

Anyone producing a map should read the relevant chapters, and should adhere as far as possible to the standard notation, the success of which is demonstrated in the following three papers.

CAVE SURVEYING IN SOUTH AUSTRALIA - R.T. Sexton

CEGSA, Occasional Paper No. 1, 1958

Newcomers to surveying should read Butcher's paper before this, as Butcher gives a more general picture and explains the basic points in more detail.

Sexton gives a fairly complete picture of cave surveying, amplifying sections outlined by Butcher, and clearly explaining the procedures developed by CEGSA. The section on procedure is clear, well written and fairly complete, but must be modified for use in N.S.W.

CEGSA mainly work in dry solution passages or large collapse caverns, whereas SUSS must contend with narrow, muddy solution passages with frequent tortuous kinks and bends in three dimensions. In general, this means:-

(1) Shorter sights - requiring distances to be measured more accurately and survey stations to be more clearly marked to avoid position errors.

(2) Less pleasant conditions, which, coupled with the need for more stations and hence more surveying time, materially lowers the accuracy, unless surveying is done for short periods only, and adequate care is taken to keep the surveyors dry and warm.

(3) The wet and muddy conditions necessitate greater protection for instruments and recording sheets. More time must be spent cleaning glass surfaces and metal scales, and a shorter life for equipment, particularly steel tapes, must be expected.

THE OGOF FFYNNON DHU SYSTEM
CRG Pulication No.6, 1953

THE SURVEY OF TUNNEL CAVE
CRG Publication No.7, 1958

- C. Lewis Railton

Both these papers should be avoided by speleos not completely dedicated to cave surveying. The complexity of the caves and the enormous time required will probably frighten off all but the most devoted surveyors.

The presentation of both papers is very good: the exploration, mapping, and possible mode of origin of the caves are treated in separate sections, with enough personal narrative to make interesting reading, while avoiding the chatty style so common in early SUSS reports.

The two caves are similar to many caves in N.S.W.: muddy solution passages, long chambers filled with boulders, numerous chimneys and crawls, with development on several levels. For this reason, anyone foolhardy enough to contemplate surveying a major cave in N.S.W., should read these papers and remember the author's conclusions -

(1) Comfort of the party is essential for accurate work.

(2) The more time spent and the more relevant readings taken, the better the final map.

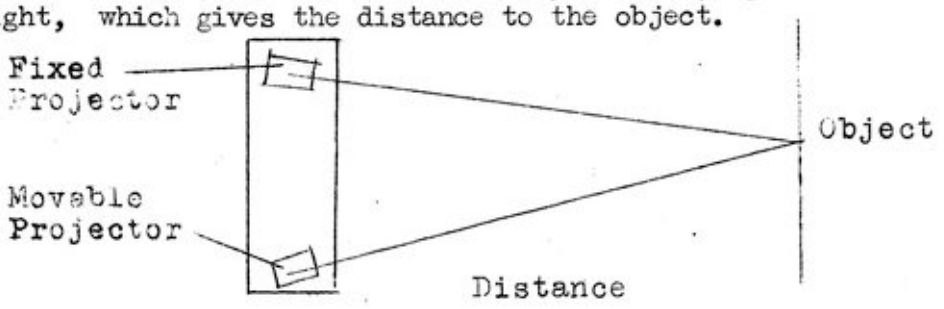
(3) Systematic work, with properly planned checks, will reduce mistakes and omission of readings.

BRITISH CAVING
1953. Chapter XVII, Cave Surveying, - A.L. Butcher

This paper contains most of the material in Butcher's paper (above), but in a more dilute and less useful form. This would be of more value than the paper to people completely unfamiliar with surveying, because it brings in each point very gradually, with a great deal of explanation.

RANGEFINDER FOR CAVE MAPPING - L. Clarke Johnson
N.S.S. News, 14, 4, April 1956.

The basic principle used is quite sound. Two beams of light are projected from the ends of the instrument; one of these beams is rotated so as to intersect the other beam, on the object being sighted. This movement is measured by a scale, geared to the rotating light, which gives the distance to the object.



The instrument, as constructed, is too heavy and bulky, has the moving parts exposed to dirt and injury and was unduly expensive (35$ for lenses alone). The machine has an accuracy of ± 2% at 100 ft. and could be used as a basis for design of an improved instrument.

Further information on rangefinders, including manufacturer's pamphlets, may be obtained from the reviewer.

INFLATING BALLOONS WITH HYDROGEN IN CAVES

SUSS 4, 2, - H. Fairley-Cuninghame

This paper describes four of the most common methods of generating hydrogen and recommends in order of merit:-

(1) Calcium hydride water

(2) Zinc hydrochloric acid

(3) Zinc sulphuric acid

(4) Aluminium caustic soda.

Toy balloons, 10 inches in diameter, are satisfactory, cost per balloon for method (1) is 3½d. to 10d., depending on the source of the zinc.

The initial outlay on the calcium hydride, precludes its use for only one or two height measurements.

The reagents must be treated with normal care - Calcium hydride must be kept in an airtight container; a bottle, or a paint tin with an outlet tube soldered on, make suitable reaction vessals.

Jon Hinwood

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F O U L A I R

Last July, the newsapers reported, in a rather hysterical fashion, the experiences of a party that met foul air in caves in the Katherine area of the Northern Territory. Now that first-hand reports have been obtained, it is clear that the experience was a nasty one, for one particular reason.

The party was equipped with carbide lamps and these did not, at any time, exhibit signs of high concentrations of CO_2, although the party was badly affected. This is contrary to all previous experience, and misled the cavers involved. The explanation offered for this, is that the very hot conditions(82° F.), coupled with the strenuous exercise, aggravated the effects of CO_2 on the party.

The experience of the party points to the need for a simple CO_2 detector, as distinct from the gas analysis apparatus used by SUSS as this is expensive and bulky. Any ideas would be welcomed by SUSS, as would further reports on the occurrence of foul air.

Could it have been a complaint about the pastry that caused the Department of Mines to state, in its report of 1900, that the catering at Cave's House, Jenolan, "continues to give great satisfaction" ?

PLUTO'S POMEGRANATE

Out of the underworld comes a tune,
Musical, melodious, the old, old rune.
It's a lure to be sure, from Orphean lyre,
As he wanders in darkness for his desire.
Forsake the cup of Bacchus, break Cupid's arrow,
Follow down the ladder, so flimsy, so narrow.
"Light into darkness", is the cry:
Revealing secrets to the eye.
For man, the fool, must master all,
So dizzily climb, and squeeze, and crawl
"Through narrow ways to greater ends",
That's the message the music sends.
Break the rocky hymen; rape virginity
Held a million sightless years in nature's chastity;
A shrine of glistening pillars, a mass of draped shawls,
Fretted forms fantastic, rock frozen water falls.
Beauty found ! Not for Beauty's sake,
But for sheer adventure in which you must partake
Once you've sucked of Pluto's Pomegranate
To loose the curse, 'tis all too late!

J. David Taylor
C E G (S.A.)

"HOPE SPRINGS ETERNAL"DEPARTMENT

Mines Department Annual Report 1902 p.129:

Wellington - An endeavour has been made to remove the foul air from the new cave without success.

P.S. 1959. It's still there.

THE CORRECT USE OF THE ALPINE ROPE IN CAVES

To the alpinist trained in the classical school, the correct use of the cord is sacred. It is, above all, a means of bringing an element of safety into what might otherwise be a difficult climb. On mountain slopes all over Europe since the time of Edward Whymper, rope technique, associated with "stance and belay" has been developed into a form of conservatism which stipulated that if a rock face would not "go" by the climber's own ability, then it was "out" on the grounds that to force it was not done in the best of circles.

Basically this attitude is very sound, in that it makes the budding climber develop himself, and not turn himself into a sort of steeple-jack, who would be lost without his ladder. Providing that he gets expert instruction from the start, the climber trained in these ways is certainly the best on nice rock. It is when he gets off the normal, that he usually packs up. Rotten rock, covered with mud, or flaked dolomite are out, they are not climbing, they are just a filthy risk not worth the odds.

But it is just these conditions that the speleologist has to cope with, and as often as not there is no other way, no alternative route for him to take. In sound alpine practice, smooth wet limestone is to be avoided as the devil, in a cave, it is the habitual condition of the rock.

In loose-thinking circles these conditions are bypassed by the use of all sorts of machines, and the results usually are those of the Abîme Pierre St Martin, where a nut came loose and a man fell to his death, much to the joy of a morbid-minded press. Little is said of the very difficult explorations that are made without the aid of machinery, (or the Sunday press), in Austria, and in France particularly by cavers from Lyon, and these could only be done by the application of the soundest technique, and the firmest of discipline.

The base of that technique is a correct application of the cord alpine to a diversity of problems, seconded by the piton and the snap-link.

Pitons first came into their own in the Dolomites, where they were invented to aid a cordée, by providing an additional secure point through which the rope could be made to pass. It was found, however, that in order to pass the cord through the eye of the piton, the members of the cordée had to unrope, so the snap-link was invented. This consists of a steel ring which can be made to snap open for the introduction of the rope, but which automatically shuts firm again.

From a simple security measure, the piton and snap-link, at least in Italy, became a religion unto itself. No overhang, no vertical pitch of those wonderful Dolomites could feel itself inviolate. The attraction of the medal "Pro Valore" caused some of the routes (many have since been climbed by normal means), to be stuck so full of pitons that they resemble pin cushions.

Members of B.S.A. in Belgium have been using these ideas, on and in the Dolomitic rocks of the Meuse Valley for some years. An"ascension artificielle" is not easy, it requires not only nerve, but a very full training. We have found that to train a good man, who is already a sound climber trained in the basic methods of rope security, takes about three years to get him up to team standard.

The whole art of climbing depends upon one thing, balance. It is not enough that a man should be able to walk in the usual way that men do, or even be able to stand on his head when occasion demands. One of the best ways to appreciate balance is to lie on the kitchen table, and then try to pass down one side of it, and, having passed underneath without touching the floor come back on top via the other side. The Table Traverse is a long-standing test first introduced by Abrahams to the Rock and Fell Climbing Club of Great Britain.

An equally interesting pastime is to stand on some other fellow's shoulders and try to drive a six inch nail into a tree branch above the head, without holding onto the branch. It's an acquired art.

Try walking in nailed boots, (which we wear underground), up a rock slope with a 40° incline. Now walk down again without using the hands, or sitting down in either case.

Again, using the hands as little as possible, traverse a rock slope with an incline of about 60°.

Underground we usually use medium rope for security and the climbs where we have to put special strain on it. Line is used for descents on rappel, and while on the pendulum.

We never walk on alpine rope!

The time has now come to rope up and find a barn wall to play on. Stone ones are the best, Yorkshire style. Lacking a barn, a cliff will serve just as well, providing that there are lots of fissures to drive pitons into. If neither is available, then it is possible to go through the motions in theory, but don't let any outsider see you doing so. He is sure not to understand.

(1) Having climbed to his first stance, the leader ties himself onto the rock-face, either with a bowline about a projection of

the rock itself, a flake for example, or he drives home a piton, and firmly belays himself to that. (See photograph 1). He is now in a favourable position to secure the second man of the cordée, who is about to climb up to him. He therefore passes the rope over the back of his shoulder, away from the direction the second man is mounting from. The rope then passes under the near arm-pit from the back, is passed over the forearm and through the hand, to lead away to the second man. Should the latter have the misfortune to fall, then the shock of the cord is across the shoulders, (not the neck), and the turn about the arm acts as a brake and permits a better hold.

(2) Having taken the place of the leader on the stance, the second has now belayed himself onto the rock-face, and he now has to secure the advance of the man who is climbing above him. To do so he must see clearly, and he leans back (photograph 2) on his belay rope, in order to get himself away from the rock face. It must be remembered that one of his great functions is to advise the leader on holds etc. which the latter may not see clearly on a vertical climb. Some little distance above the second's head, a piton and snap-link have been placed in the wall and the lead rope has been made to pass through this. It then turns the arm of the second, passes under the arm-pit to cross the back and descend, as the free slack, over the front of the away shoulder. Slack rope is controlled by the away-side free hand, but the lead hand is kept raised in the the direction of the leader. If the latter falls, the shock is taken by the lead piton, and the brake action is made on the second arm and shoulder. If, under the force of the fall, the piton fails to hold, the second still has the advantage of not having all the shock on himself.

(3) In order to secure his upward progress the leader often finds it to his advantage to plant pitons at regular intervals, and particularly if he is engaged in a double attached rope climb. (See below). Even after hours of practice with six inch nails and tree branches, it is not easy to drive home a piton on a near vertical rock-face. It's essential that he should get away from the rock-face as far as balance will permit. This is done on a piton belay at waist level if possible., but in order to do this one hand must usually be engaged in keeping some sort of equilibrium. The disengaged hand places the point of a piton in a crevice, then finds the hammer in the pants' pocket, and with this he hits the piton. (On which the piton falls out). In order not to encourage the second in his choice of adjectives, during this trying period it is better that something like a pistol lanyard be worn, to which is attached a small snap-link. This is attached to the eye of the piton to stop its fall if the hammer blow is bad.

(4) If the hammer is usually contained in one of the leader's hip pockets, it is equally true that in the other he holds a number of loops made from a six foot line. These on occasion may be used on belay cords. They may also be used as artificial holds. For example, the leader in his line of upward progress may find before him a slight overhang, or even a plain wall with no real holds, for a few feet. He drives home a piton as high as he can, with a large snap-link inserted into the eye. His own cord, leading away to Number Two of the cordée is in turn passed through the snap-link as a measure of security, no slack being permitted, at any time, between the moving member of the cordée, and his support (see photograph 3). The leader is now safe, but free to move in any direction he may think fit. His next concern is to take one of his loops and fix that onto the snap-link, in such a way that it forms a foot-hold. After adjusting this to the required height, he may then step into it (photograph 4) and raise himself. In theory it is possible to make a series of holds in this manner, but as the climber has to hold onto the snap-link with one hand at least some of the time, it becomes hard on anyone who is not over-strong in the arm.

(5) If it is a question of forcing a passage up a cliff, using the piton to overcome the lack of natural holds, then it is better to do it by the system of double safety ropes. By this system the leader is assured by two ropes one to his left hand, one to his right. He climbs up by setting up two lines of pitons, one to the left hand, one to the right. Into these lines of pitons are inserted snap-links, and into these in turn go the respective right or left hand safety ropes. He is then pulled up the cliff face by each alternate rope. The rope that is not being pulled upon by the second of the cordée is usually given a few feet of slack and anchored, so that it acts as a fixed assurance. The leader himself tries to make life a little more comfortable by using a body loop, which he can snap onto the highest pitons and so give himself a good hold, and on which, as often as not he can raise himself, to pass the free-running rope into its new snap-link,(photograph 5), before the Second pulls on it, - HARD -.

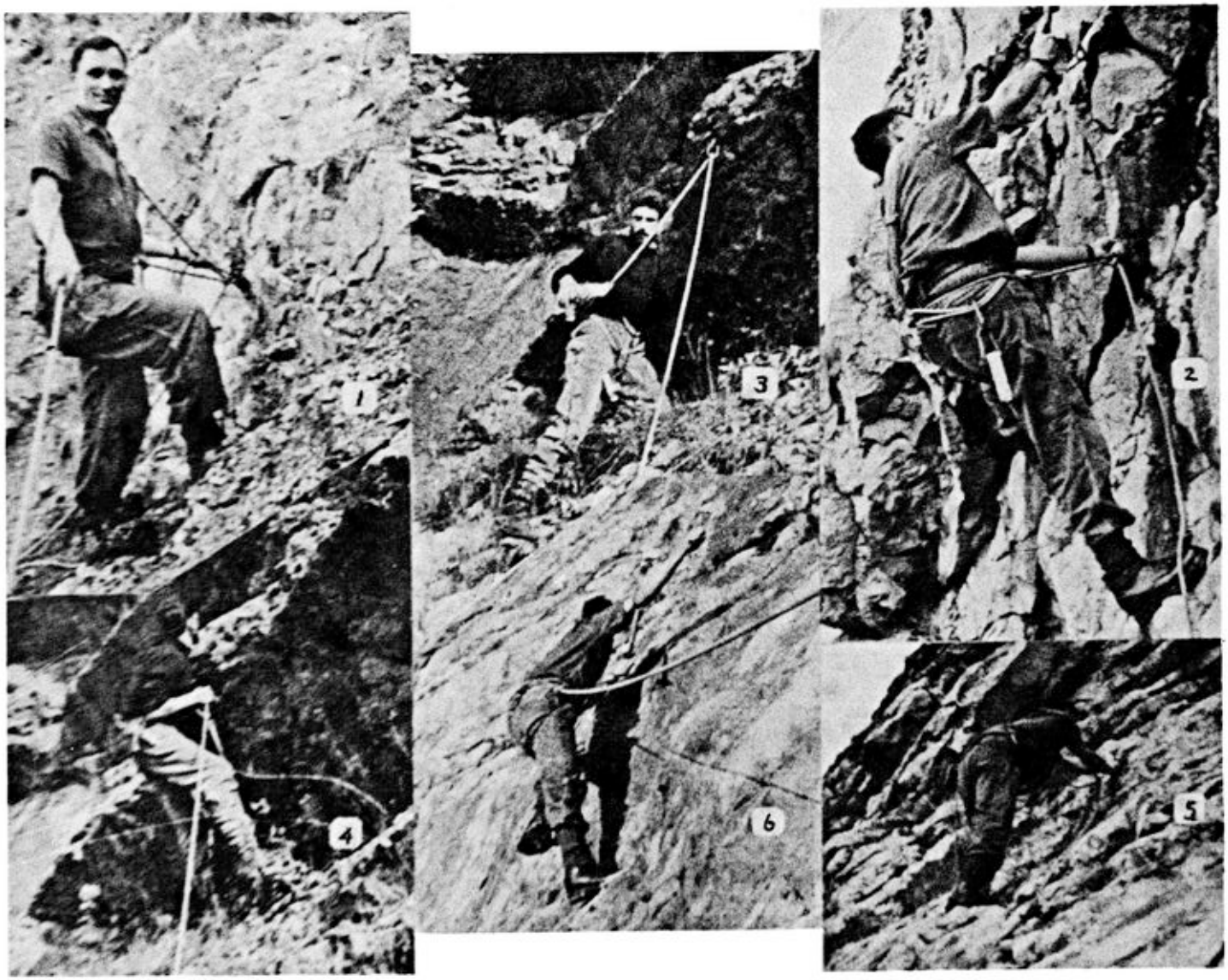
This, the true "ascension artificielle is a slow way to get up a wall, but given a good sense of balance, and working together in a "sorte communion ", wonders can be done. On the average dolomite of the Meuse Valley, our well-trained team take about one hour to climb 10 metres, and we have done 60 metres in two hours under very favourable conditions. It must be pointed out also that the whole face of the rock was pitoned every 3 feet or so, and the pitons themselves were used as footholds. Under normal cave conditions, a piton here or there is quite enough, and they can usually be recovered by the last man. He has little

else to do anyway, it's the upstairs men, who pull him up behind them, who do all the work. It must be stressed, that this type of climb is not for the untrained. It is very delicate and can very easily turn into sheer hell, if bad weather comes. It is, however, highly suitable, again to a good team, in muddy chimneys.

(6) Sometimes it is desirable to make a traverse to the right or left over a smooth rock. In the case where there are some slight footholds it is sometimes possible for the leader to cross over by a system of direct traction. He plants a piton and snaplink as high as possible, and as near to the face to be crossed as he can. Into the link he places his rope on which he is assured by his second in the cordée. This last man must now keep the rope taut, while at the same time paying it out slowly to the leader's desire. Should it be wished to make the traverse to the right, then the leader, who is facing the the rock, takes the cord in his left hand, and then leans on it to the right. At the same time his right hand extends out as far as it can, and he pulls himself, by traction across the rock-face. On slightly inclined faces this method has much to recommend it. It has however a great drawback, in that, if the leader slips, the second can hold him, but might have the greatest difficulty in extricating him from the position to which he has slipped.

(7) A far better system of making the traverse of a similar expanse of rock, is by way of the "Pendule". It is assumed that the cordée is advancing from right to left, when a series of slabs is met with, showing slight holds. As above (6), the leader plants a piton etc. as assurance back to his second. If possible he then climbs up, vertically, and as high as he can, he plants another piton. If he can't get up, possibly another member of the cordée can do so for him, and plant the piton. From the latter, a double cord is hung, (usually it is a line) and onto this the leader suspends himself in the form of rappel called the pendule. The pendule differs from the ordinary rappel in that, for line, it gives a larger friction surface with the climber's body. The double cord passes down between the legs, (photograph 6) and at the back divides, so that one line comes up on the outside of each thigh. The lines are then crossed in front of the chest, and one is hung over each shoulder, to hang free down the back. In this way the balance of the body is well distributed, and it is enough to hold the down lines to control the movement of the body along the line. Assured by his second, the leader then moves out across the rock face on a pendulum.

(8) Having got up, it now only remains to come down again, and it is usual to do this on rappel. On line, the usual method of attachment, is to pass the double ends down through the legs,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then up the ouside of the left thigh, to cross the chest and pass over the right shoulder. The lines as they descend down the back are then controlled by the left hand at the level of the left flank, and with the left arm held relatively straight. This hand controls the movement of the lines as the body descends. The right hand grasps the down-coming lines and control the balance. With medium rope, used double, it is often enough that it turns one thigh, and then passes over the crook of an arm. In this case, down movement is controlled by a simple flick of the elbow. This last method, however, requires confidence and some practice.

It will be noted that nothing has been said here about basic rope technique as seen in ordinary alpinism; the reason is that it is well known, or should be, to all climbers and cavers. No mention has been made of climbing ropes or Prusik slings etc., for the same reason. Equally, one or two of the methods employed in the Dolomites have been ignored where, even, little seats are taken up to sit in while hanging from the rock face by a piton. All that has been discussed are those applications which we find very useful in our caves. Those applications, we have proved to be sound and practical to speleology.

Basil Marsden.

KEY TO PHOTOGRAPHS (Plate 1)

1. Leader supporting second climber.

2. Driving piton.

3. Leader supported by rope, snap-link and piton.

4. Rope loop being used as step to gain height.

5. Climbing with two ropes. Leader passing right hand rope into snap-link.

6. Moving to the left, across the rock face, on the "Pendulum" (note the double rappel).

Food For Trips With Transport

Have you tried Jaffles, on a trip? Most households own a Jaffle Iron, even if they do'nt use it, and Jaffles make a tasty meal out of the most unlikely left-overs. (Salmon and New Zealand epicure are a good beginning.)

NEW VARIETY OF CAVE ANIMAL

During January of this year, parties from the mainland visited Tasmania to take part in activities associated with the second General Meeting of the A.S.F.

In and about Tasmanian caves, animals were observed, that differed markedly from the types found in association with mainland caves. These differences may or may not justify the erection of their species. A description of the differences observed in one species follows.

Habitat - Widespread, being found in all parts of all parts of the caves and also on the surface, in the vicinity of caves. When in caves it is restricted to the floor, while mainland forms are found also on walls and often roofs of caverns.

Locomotion - More commonly bipedal than on the mainland where a prostrate slithering motion is more often seen.

Light Emission - Both forms emit a more or less intermittent light, but on the whole Tasmanian forms generate a whiter light, with the exception of one specimen (specimen D) which produced a very bright illumination.

Voice - Normally an intermittant drone, interrupted at times(in specimen D) by a discordant cackle. No marked musical ability, was at any time, noted.

Body Shape - Little more variety than observed in N.S.W. although some specimens were more obviously anthropoid than any reported N.S.W. varieties.

Body Colour - As on the mainland, colour was often obscured by cave mud, but appeared to be basically similar.

Response to Stimuli - When startled moved sluggishly along well marked passages. Small openings were usually ignored. The most marked difference from the mainland forms lay in the preference exhibited for travelling in the water. Whenever two routes were available, the wetter was chosen. Mainland forms, it is noted, show a marked preference for drier conditions.

These differences in habit, do not, in the opinion of the author, justify the erection of a new species, as has in recent times been done on flimsy evidence. As an alternative the author proposes that a new variety be recognized as Homo sapiens var., tasmaniac.

(In view of possible repercussions, the author wishes to remain anonymous. ED.)

SUSS ENTERS THE COMMERCIAL WORLD

This summer, tourists, who are unable to take photographs in the main N.S.W. Tourist Cave Systems, will be able to buy top quality 35mm. slides of the cave interiors. If they look carefully at the box holding the slides they will see the words "A SUSS Production". Few tourists know what the letters SUSS stand for, and probably would be surprised to find the firm making the slides is operated by speleologists to finance their club's cave exploration.

For a number of years dissatisfaction had been expressed at the quality of colour slides of the Jenolan Caves then available to tourists. Early this year Mr. Best (Director of the N.S.W. Department of Tourist Activities) invited the present manager of SUSS Productions to submit a set of 12 colour slides of the interiors of the Jenolan tourist caves. Two photographic trips were held to obtain the necessary colour transparencies. The results were so highly satisfactory that the Director encouraged SUSS to set up a firm to wholesale colour slides of the N.S.W. tourist caves.

SUSS Productions supplied its first order -1200 slides to the Jenolan Caves Kiosk and 528 slides to the City Travel Office of the Government Tourist Bureau - at the beginning of August. The Jenolan slides have proved very popular as can be gauged by the sale of over 3,500 Jenolan slides in the first three months of business. A set of six Wombeyan Caves is now available and a set of Yarrangobilly Caves will be ready by Christmas. In answer to a number of requests from our retailers, a set of 12 Blue Mountains slides has also been produced.

Duplications are produced at the Kodak laboratories and the titles are printed by a local firm. Slides are packed in envelopes by SUSS members before dispatch to retailers.

For a number of technical reasons the cave photography technique used is the combination of Type A colour film with flood lamps. This poses a number of electrical problems especially in view of the need to maintain a constant 240 volts, for the photofloods during photographic exposure, from the cave electrical supply whose voltage fluctuates from as low as 60 volts to 110 volts. A 2 K.V.A. transformer, built specially for the job, can handle any voltage above 75 volts.

In photographing remote sections in which either insufficient or no power is available, the transformer is connected to the cave electrical mains closer to the entrance and anything up to 600 feet of heavy duty flex is laid from the transformer through the cave to reach the site of photography. Here a compact control panel varies the voltage for the photofloods from a warm-up current (about 170 volts) up to full potential (240 volts) as required. The photofloods used have inbuilt reflectors and, to protect them from water and breakage, are mounted in stout metal shields.

Members of speleological societies may obtain copies of the slides, which retail at 4/6, at a discount, on application to the manager, at 66 Cliff Road, Epping, N.S.W.

Warren Peck (Manager)

SIX FEET UNDER THE EARTH

Geof Wagg

(Reprinted from "The Sydney Bushwalker" January 1959, by kind permission of the author.)

Now speleology (or cave exploring) is a subject on which I delight to let my hair down because I've done quite a bit of it and haven't enjoyed it very much. Why do I go at all? Ah! well you see, Grace is very keen.

I think one of the most humerous things about caving is to hear the performance of someone caught in a "squeezehole", providing of course you are not following them through. A squeezehole is a small, often tiny, passage of varying length that connects caverns underground. These passages must have been a tight fit even on the water which originally formed them and yet, for certain intrepid cavers, they provide what could almost be described as a fatal attraction.

One such 6'-6" explorer, known to his friends for irrelevant reasons as "The Admiral", was almost fatally attracted to a squeezehole in the Mammoth Cave at Jenolan. Personally, I can't believe that this particular hole was worn by anything but an intoxicated spirit because in its 25 ft. length it performs every contortion known to geometry, except the corkscrew. It begins with a straight slit 12" wide, goes into a backward 'U' bend, develops into a forward 'S' bend and finishes with fishhook and keyhole. This may sound uncomfortable, but let me assure you no description can convey the feeling of discomfort inspired when one is actually stuck!

Now the Admiral's first mistake was to take up caving at all - he's just not built for it, but more to the point in question, his mistake was to enter the 12" slit entrance of the squeeze on his left side instead of his right. So it was he encountered a minor setback right at the beginning when he found that his spine just wouldn't bend backwards sufficiently to fit the 'U' bend. He passed this information forward and was in no way relieved by the hilarity.

"You'll have to get through, Admiral,you're holding up half the party!" Muffled mirth.

"But I tell you I just don't bend that way!"

"Can you get onto your other side then?"

With a tremendous clatter of hobnails and laboured grunts, the Admiral sought to rotate himself in the confined space.

"Watch out Admiral!" complained Bev, who was right behind him. "You nearly got my teeth then!"

At last, with a final grunt and sigh, the Admiral announced,"I've done it, I think."

"What do you mean you think?"

"Well, my feet are still facing the other way."

"Never mind them. They'll come with the rest of you."

As you may imagine, the sound of even heavy breathing in such a confined space is considerable, but when it's a matter of grunting,puffing, panting and kicking hobnailed boots against hard limestone, the din is deafening.

All these sounds were heard(together with some muffled curses) as the Admiral progressed around the 'U' bend. He'd just got his feet back facing the same way as his head, and his head and shoulders were moving into the second part of the 'S' bend, when he discovered that his feet weren't following him. In fact, his legs from the knee down seemed to be just too long to fit round into the 'S' bend. He experimented with a few different angles and succeeded in getting one leg jammed with the knee in a hollow in the floor and his foot hooked somehow on the roof.

"Er, Bev, can you see my right foot?"

"Yes, it's there Admiral."

"I know it's there! But can you see why it wont come down from the roof?"

"That's your <u>left</u> foot on the roof."

"What! Are you sure you're looking at my feet?!"

"Size eleven."

"Must be. I suppose I got them muddled when they were facing the other way. Well, can you get it unstuck, whichever it is!"

"Hang on, I'll try."

There was a pause while Bev manouvered into a better position, then came the sound of blows interspersed with cries from the Admiral.

Thud! "Ow!" Thud! "Ouch! Thud! "Hey!! What are you getting it out with?!"

"I'm trying to knock it out with my rock hammer, but it won't come. I'll have to take off your boot. Hang on."

"Hang on! Where do you think I'd go."

While Bev laboured to remove the boot, the carbide lamp at the other end of the Admiral, which had been flickering for a time, finally went out, leaving him in darkness. With more muffled curses, the Admiral decided to rectify this because, quite apart from being in the dark, the acetylene gas, no longer burning, kept leaking into the atmosphere and while it wasn't dangerous, it smelt vile. The matches, of course, were in his overalls pocket and as he was lying on his right arm, he couldn't use that, so after much labour he got his left arm down near the matches just as Bev removed the boot.

"Right! Off you go Admiral!"

"I can't. I'm not ready yet!"

"Not ready!! You do nothing but lay there while I wait on you hand and foot and then you're not ready!"

"But my light's gone out!"

"What do you need a light for? You can't get lost."

So it was that the Admiral was talked into proceeding with one boot on, both arms by his side and his light out. Of course he didn't get more than a foot before the leg with the boot on got caught, and by this time his shoulders were also jammed and the lamp was leaking acetylene right under his nose.

I wont bore you with the rest of the story. Enough to say that the Admiral extricated himself with the greatest alacrity when Bev accidentally? left her carbide lamp playing against his overalls and set them on fire.

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This episode has given rise to one of the best caving ditties sung locally. This was included in the S.B.W. Chronic Opera, "A Thousand and One Troglodites".

(Tune - "Keep right on till the end of the road")

Whe a bod's stuck right in a squeezehole tight
And jammed in a sharp S bend
Make no comment bright of his end in sight
Though all that's in sight is his end.
For if the mind should panic the body will swell
And trapped for good he may be
So spray his toes with a garden hose
And treat him with cups of tea.

But if this won't work shun the short sharp jerk
For a tug may well dislodge
A ton of dirt on his shorts and shirt
So you see its a dangerous dodge.
Take the rope around some convenient part
If you want your friend to live
Get three men on the rope, grease him up with soap
And something has got to give.

If he's still stuck fast there is just one last
Resort that you yet may try
For the die is cast and all caution past
It's a case of do-o or die.
Take an oxy-, blow-torch or some other flame
That burns with an intense heat
And with action sly this flame apply
To the poor trapped victim's seat.

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