

ASF

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P.O. Box 388
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EDITORIAL

Conservation is the principal theme of this editorial. In issue No.74, I made mention of the problems surrounding the South-West National Park. The main object of contention was Precipitous Bluff, long a thorn in the side of conservationist and politician alike. In mid-June, the Full Bench of the High Court of Australia dismissed the appeal by conservationists. The Minister for National Parks and Wildlife, Mr. Batt, has stated that this will in no way alter the status of Precipitous Bluff and that it will remain in the South-West National Park. The legal argument concerned an important legal principle. Mr. Batt went on to say that the only way in which the natural state of the South-West National Park can be affected was by a management plan, which is drawn up by both Houses of Parliament. However, it was extremely unlikely that any government would present a management plan to Parliament allowing mining at Precipitous Bluff! This, however, remains to be seen but it appears at this stage that this area has gained a respite for now.

Not so the Lower Gordon! HEC (Help Eliminate Caves), according to a recent press statement is claiming that even under depressed economic conditions the electrical energy demand is increasing at about 4% per year! At this rate it estimates that it will be necessary to double its generating system by 1999! In an effort to alleviate this "drastic" problem, HEC has come up with yet another of its brilliant ideas. The first and biggest proposal involves the integration of the King, Franklin and Gordon catchments with the total flow being processed via the Gordon River.

The alternative to this, claim HEC, would be to develop the combined flow of the Franklin and King Rivers via the King River with a separate scheme on the Lower Gordon. This would involve the diverting of the King River into the Franklin River basin by a dam at Tofft, near Crotty. Therefore, the combined flows of the Franklin and King would then be developed through a dam and power station on the Franklin below the junction of the Andrew River. This station would be able to produce an average of around 1,170 million kilowatt hours of electricity a year. The Lower Gordon River would subsequently find itself being dammed a short distance downstream of the Franklin River Junction. A station at this point would be capable of generating 1,800 million kilowatt hours per year from the flow of the King, Franklin and Gordon Rivers. It has also been suggested that dams be placed at Albert Rapids, below the junction of the Serpentine and Gordon Rivers and the diversion of the Davey into the Lower Gordon via the Olga-Hardwood saddle, enabling HEC to harness the 34 metre difference in elevation between the Gordon stage one scheme and the Lower Gordon Dam.

Of course at this stage the HEC are claiming that these are only suggestions but it's a safe bet that sooner or later one of these schemes will be chosen and an unknown number of caves will suffer. According to recent reliable information, the Franklin-Lower Gordon is potentially the largest area of limestone in Australia. A substantial number of caves have already been located along the two rivers and one can only speculate at what lies beyond the rivers themselves. Although these proposals will not occur within the next two years at the earliest, a thorough study of the implications must be prepared as soon as possible.

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CAVING IN SOUTH AFRICA

by Imants Kavalieris

Organised caving began in South Africa about 20 years ago with the formation of the South African Speleological Association (SASA), which remains the main caving society active today. SASA is comprised of two sections, one in the Transvaal (Johannesburg), and one in the Cape (Capetown). The two sections are largely independent but are governed by a 'Central Committee'. The official publication of the Society is the SASA Bulletin, generally produced as material becomes available, at least once a year.

The Transvaal caving area is the most important, as it is extremely large. Precambrian dolomite, approximately 2,200 million years old, occupies 14,000 square kilometres, or about 5% of the Transvaal (see Map 1). In the Cape, the main caving area is near Oudtshoorn, where the well-known Congo Caves occur. The area contains about 20 known caves in Precambrian limestone, but is relatively small, as the limestone occurs as lenticular bodies with a maximum width of 600 metres. Apart from Oudtshoorn, in the Cape Province a few small caves occur in the North East Cape in dolomite, in the Bredasdorp area in soft porous Pliocene limestone; one cave occurs at Richtersveld in Precambrian limestone (Blacquiere, 1969) and numerous caves occur near Capetown in the Table Mountain Sandstone. The sandstone caves are mainly widened joints. An interesting exception is Ronans Cave (Kavalieris, 1976) which although controlled by joints, has developed internally and is roofed by solid rock.

The largest caves known in South Africa occur in the Carletonville region, South West Transvaal, about 50 kilometres W.S.W. of Johannesburg. This area is part of the Highveld, which is flat or gently undulating country of about 1,500 metres. Most of the area is farmed or is gold mine property. Caves and related karst features are conspicuous as depressions and clumps of trees in sinkholes, very easily detected on aerial photographs. As such a large area is involved, much field prospecting remains to be done.

The largest cave known is Apocalypse Pothole (see Map 2) which has 10.82 kilometres of passages. Although the entrance sinkhole was known to local inhabitants for a long time, it was first entered by the farmer-owner, W.H.E. Kinnear, in 1965.

It was discovered in late 1972 by SASA and fully explored and surveyed during 1973-75 (Martini, et.al., 1976). The entrance is a 50 metre pit from which a complex fissure system extends. The deepest point of the cave is -85 metres. Other important caves in the Carletonville region are:-

Wonderfontein Cave (Kent, et.al., 1976) 9.31 kilometres; an easy cave but extremely complex, it is a good example of phreatic development and is historically important as the first cave described from the Transvaal, in about 1865.

West Driefontein Cave (Martini, et.al., 1977) 5.65 kilometres; is notable as at -183 metres, it is the deepest known cave in South Africa and also contains an enormous chamber, Texas-Deep Range, with the dimensions of 150 x 80 metres and up to 40 metres high.

Chaos Cave (Kavalieris, et.al., 1976) 3.75 kilometres, is a complex multi-level system, extremely well-decorated.

Boons Cave (Kavalieris, et.al., 1977) 3.35 kilometres, is a large simple cave with big passages and chambers. It was mined for phosphate and calcite in the 1940's.

Further west in the Transvaal, caves occur sparsely and are generally small. Over much of this area, the watertable is shallow (10-15 metres) and hence prospects are not very good. Of interest here, however, is 'Wondergat', a deep water-filled hole, (sinkhole) popular as a tourist attraction. It has similarities to the cenotes of Yucatan. Nearer to Johannesburg and Pretoria, many caves occur in the Krugersdorp area. Caves are more numerous here than at Carletonville but are small, though sometimes well decorated. Some of the most important are:-

Groblers I Cave (Verhulsel, 1974), 1.5 kilometres; containing several lakes and some very good formation.

Nicos II Cave, approximately 2 kilometres (survey not completed), a fissure system developed on two orthogonal joint directions, noted as a 'sporting' cave.

Van Wyks Cave, a well decorated cave with massive calcite formation, it consists essentially of one enormous chamber 120 x 40 metres in plan, and over 20 metres high. It is entered spectacularly by a 20 metre free-hanging pitch through a slot in the ceiling.

The Krugersdorp cave area is also important as it contains the Sterkfontein fossil site, a cave deposit which in 1936 yielded the first adult cranium of Australopithecus (the fossil ape-man), and which has since proved to be one of the richest sites for early hominid fossils in Africa. It is of interest to note that Dr. Robert Broom, who did much of the pioneering work on the Transvaal ape-man bearing cave deposits, earlier in his life worked on the extinct marsupial faunal assemblage at Wellington Caves in N.S.W.

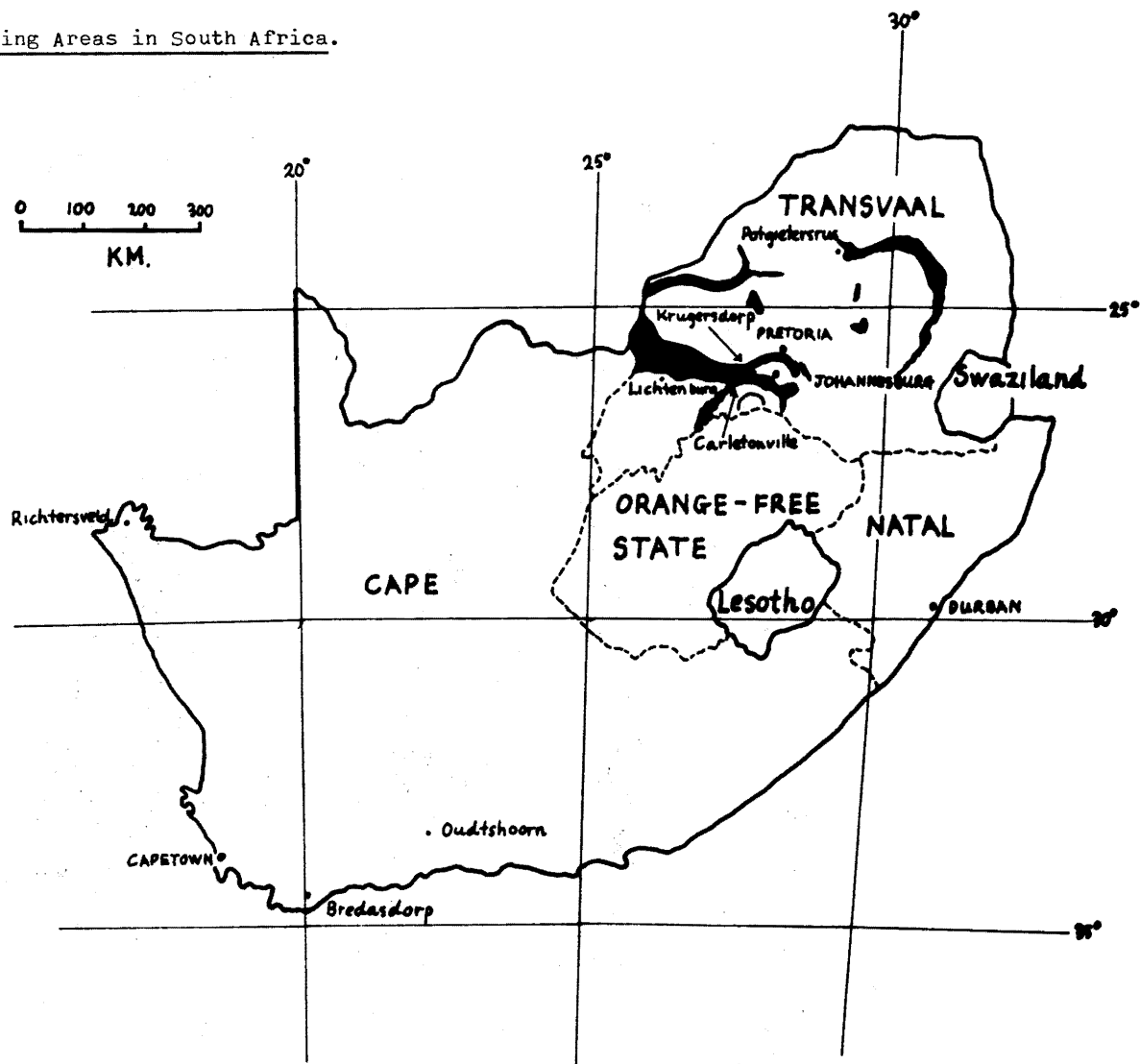
In the north and eastern Transvaal, there are many caves but most are small. Most important are Sudwala Cave, a well-known tourist cave, and the Wolkberg Cave, which consists of two interconnected chamber

CAVING IN SOUTH AFRICA Cont;

about 60 metres in diameter and a 800 metre long passage. It is spectacularly decorated by massive stalactites, stalagmites and columns. The area also contains the deepest pit in South Africa - the Bathole, about 90 metres.

Large caves in the Transvaal have a phreatic origin, and vadose modification is in general minor, serving chiefly to open the systems to the surface. Strong control by the paleo-watertable resulting in horizontal development is apparent, and complex poorly integrated fissure systems controlled by joints are common. Collapse features in the brittle dolomite are an important aspect of cave development and modification. Collapse reaching the surface has formed entrances, or at depth has enlarged chambers (e.g. Texas-Deep Range) and is often found to block large passages that appear to be promising extensions. Upward progression of collapse ultimately leads to the development of enormous bodies of dislocated dolomite surrounded by more or less perfect "ring caves". A good example of this type is the Ficus-Peppercorn caves near Potgietersrus, North Transvaal.

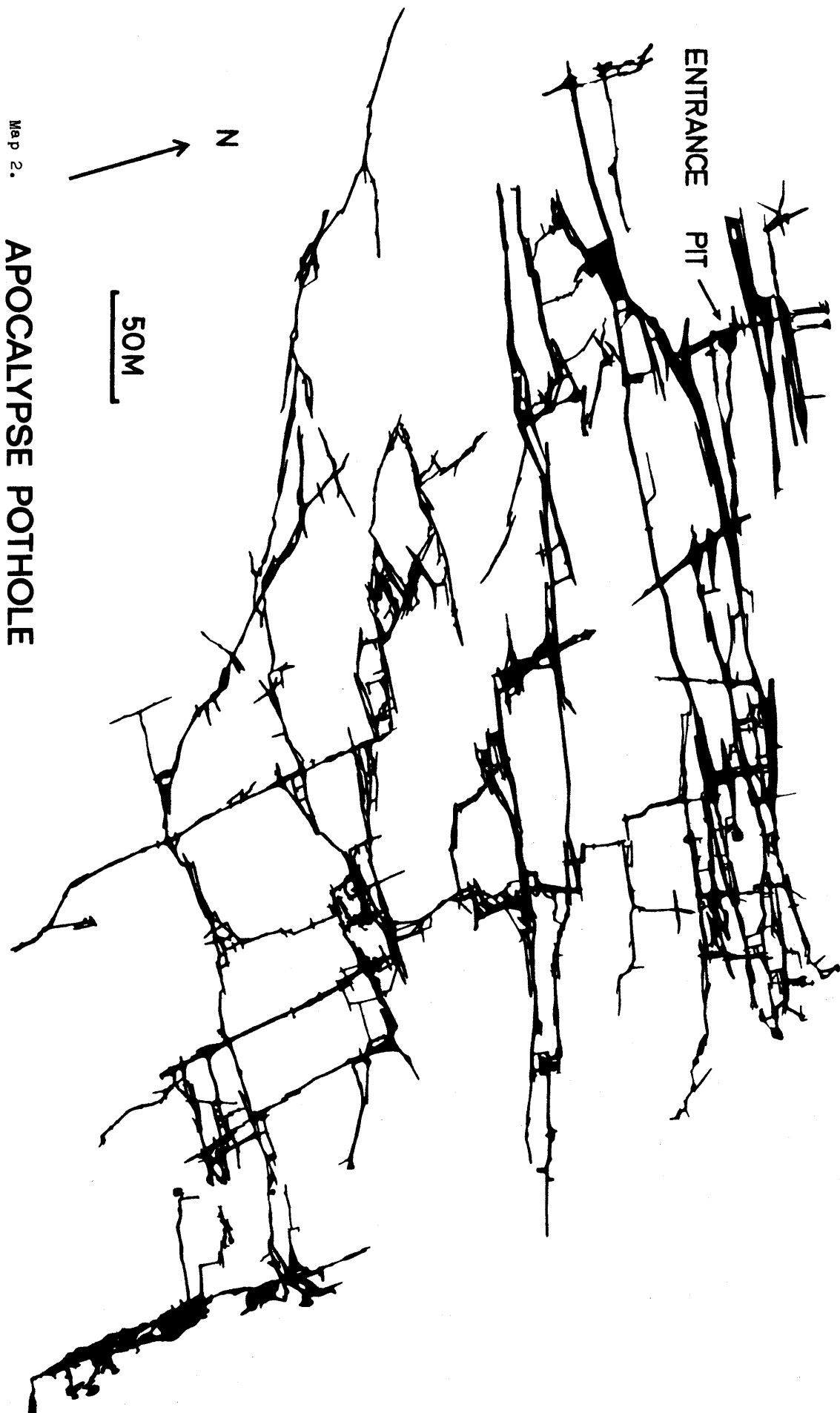
Map 1: Caving Areas in South Africa.



■ **Distribution of dolomite in the Transvaal.**

In the Transvaal caves are usually dry, sometimes dusty, with a relative humidity less than 100%. Flowing water only occurs in a few cases after thunderstorms, otherwise if water is encountered at all, it is as still pools, usually at the watertable. Therefore caving in the Transvaal can be thirsty work. As well as being dry, most Transvaal caves are very dirty as the walls are coated with a brown to black spongy dissolution residue, composed of a mixture of oxides of iron, manganese and silica.

Speleothems are now generally poorly developed in the Transvaal caves but there are some exceptions, for example, Chaos and Wolkberg caves. Most massive formations are inactive and strongly corroded by aggressive vadose water, leaving only relics of the massive speleothems accumulated in past wetter climatic periods. Delicate formations of much more recent origin are characteristic of the Transvaal caves. The delicate carbonate speleothems are interesting mineralogically, and apart from aragonite



Map 2.

APOCALYPSE POTHOLE

CAVING IN SOUTH AFRICA Cont;

which is especially common, and calcite, they include hydromagnesite, magnesite, nesquehonite, dolomite and huntite. In general the cave mineralogy is complex and interesting. About 35 secondary minerals are known, including phosphates, nitrates, sulphates and oxides.

Cave biology has not been studied extensively in the Transvaal, but as the caves are dry, cave fauna is not particularly abundant.

All cavers in the Transvaal are conscious of Histoplasmosis and at some time have contracted it, as it is present in virtually all caves. In the Cape where conditions are cooler, it does not appear.

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HOW'S YOUR BASH-HAT SHAPING UP?

by Laurie Moody

I was both amused and interested to read a recent article in the NSS News Vol.35 No.3, which featured the latest development in caving helmets. This is one extremely trusty piece of caving equipment that you don't hear a great amount said about. Made in West Germany, these phosphorescent helmets glow an eerie green colour after being exposed to light. They are manufactured in polyamide and appear something similar in design to those worn by most cavers. The difference between fibreglass and polyethylene is that polyethylene absorbs impacts by elastic deformation whereas fibreglass bends and breaks the fibres. Of the two, fibreglass has proven to be the most durable. Polyethylene and polyamide tend also to age over an extended period of time and may even develop cracks.

Just how often do you check your bash-hat to see how it is after sustaining a resounding blow from an extremely solid piece of limestone that you somehow failed to see? Most times? Occasionally? Rarely? Or, are you one of those people who say "?!@*!?" and forget all about it? I guess that I have fallen into the last category on most occasions but a few weeks back, I made a slight misjudgement whilst visiting Welcome Stranger Cave in the Florentine and THUMP! After picking my false teeth up off the floor of the cave, I decided that I'd better check my lid when I got out. Later, a close examination revealed a faint inch long fracture on the side of my helmet. All helmets should be inspected closely after each caving trip and I daresay that if you were to spend five minutes or so checking your bash-hat, you too could possibly find a fracture of some kind.

Cavers however, tend to develop an almost "maternal" love for their faithful bash-hats but there comes a time when it must or should be replaced with a brand-new 'prospective-type hat. Despite the fact and you only have to go caving with any club to see it, that battered bash-hats serve as a status symbol with many cavers, there comes a day when your life could depend on that important and necessary piece of any speleologist's equipment! Check yours and see if it is time for a replacement!

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LEVIATHAN CAVE - LAVA CAVE

by J.W. Simons

During mid-April, 1976, a team of seven members of the Cave Exploration Group of East Africa undertook a ten-day, locally sponsored, expedition in what is at present claimed as the world's longest and deepest lava cave.

The cave lies in a magnificent wilderness of geologically recent ash-cones and vast lava fields which make up a 65 km. long mountain range known as the Chyulu Hills, bordering upon Kenya's famous Tsavo National Park (West). Many lava caves have been discovered in the pahoehoe flows of this fascinating area by the C.E.G.E.A. during the last decade, most involving extended foot-safaris through forest and game rich bush to reach their entrances. Lava flows, some of which reach distances of 20 km. from their source volcanoes, encompass an incredible area of many hundreds of coalescing craters, having pushed their way out through the loose unconsolidated ashes at the bases of the cones.

All major tunnels so far examined show evidence that they were formed by the extrusions cutting channels down into the underlying pyroclastics surrounding the cones, lining them with successive onion-skin layers of lava to form underground conduits feeding the flow snout. Progressive downcutting, as demonstrated by lava verticals ('falls') representing nick-points of headward erosion, and lowering of the flow level within the active channel produced multiple passages one above the other. High-level, braided, side-passage systems are now known to occur in the most recent discovery and are interpreted as 'feeder tubes' to the main 'drainage' tunnel, formed in the lava sheet overlying the pyroclastics (see Simons, 1971).

At 1,600 m., high in the Chyulu range above Kibwezi township and running eastwards from the base of the ash-cones and finally beneath the thick, confusing game-inhabited Kibwezi Forest, Leviathan Cave was first 'discovered' through a study of aerial photographs and received its first C.E.G. investigation in September, 1975. It took C.E.G. members five extended two and three-day trips to explore the main tunnel line and some of its upper levels, bivouacs being made at the cave. Difficulties of exploration were aggravated by a 240 km. vehicle distance from Nairobi, a hike of 4 km. to the main entrance and by having to back-pack all water supplies in addition to foodstuffs and equipment. To locate additional entrances over the cave it also became necessary to blaze trails through the forest on compass traverses, the last two collapse holes lying deep within the Kibwezi Forest a further 4 km. downflow of the main entrance. Supply-lines to the farthest reaches of the cave were, therefore, rather extended and it became apparent that to produce a high-grade survey of the entire cave would be a protracted affair involving many costly visits. The ten-day expedition was organised principally, therefore, to establish the cave's exact length and vertical range as well as to investigate many upper levels which remained un-entered. Local sponsorship was sought and many Kenya-based companies came forward with generous donations of equipment and foodstuffs (e.g. Union Carbide (batteries), Bata (special boots), Kodak (film/processing)).

A tented Expedition Base-Camp was established at nearest road-head from which four recruited African porters would back-pack daily food and water supplies to maintain an Advanced Base established near one of the entrances about mid-way along the length of the cave. From Advanced Base Camp, teams would survey both up and downstream, exploring any new sections on route and bivouacing as required. The Advanced Base was to have been a surface camp but torrential downpours the first night flooded all tents and bedding and a new underground bivouac site had to be set up in another lava tube not far from the main cave.

The principle tunnel of Leviathan Cave, with many sections up to 10 - 15 m. in diameter and large enough to permit a bus, has now been explored from an ash-choke directly beneath the slope of the source volcano, downstream to a seemingly impenetrable boulder seal for a single passage length of 8 km. This great length is only broken in two places by collapse entrances, where linking digs through boulders had to be undertaken, dividing the passage into 3.5, 2.5 and 2.0 km. segments. Ten other collapse entrances are known over the cave line, but each of these provides entry to high passage sections, the otherwise continuous lower level passing beneath. Discontinuity of the upper levels or natural breaks in their floors provides access to the lower section.

Vertical lava 'falls' are prevalent in the most upstream part of the cave - Lava Falls Way - there being one of 2 m., three of 4 m., one of 5 m., and one of 6 m. (Scorpion Falls). A climb of 10-15 m. in a shaft passing from the lowermost level up through two higher level passages enabled the upstream survey party to exit at a small collapse 250 m. downflow of the source volcano. Downstream of the main (Bushbuck) collapse, the Mud Hall Series continues descending steeply downflow to Forest Collapse, a number of ox-bows and a braided side system being encountered mid-way along this series. From Forest to Compass collapses the angle of descent gradually decreases. Compass Collapse marks the first break in continuity 3.5 km. from the Terminal Choke and with a vertical range of 305 m.

The next 2.5 km. segment of the main passage - Goliath Passage - has some impressive 'canyon-like' cross-sections up to 15 m. high and though it drops only another 100 m. to Pottery Collapse it is a very wearing section to traverse with its great slippery breakdown piles. It was along this series that several new and previously unsuspected branch-passage systems of 0.3 and 0.4 km. were discovered running parallel to the main tube and connected to its upper levels.

Pottery Collapse marks the second break in continuity, downstream of which it is mostly easy walking for the next 2 km. to a 100 m. long liquid guano crawl in boulders marking the present 'end' to the cave. A disappointing finish to a magnificent lava cave, though it is suspected that the tube continues much further beyond this choke as many kilometres of lava still lie ahead.

NOTICES & NEWS

GLOSSARY OF GEOLOGY REVISION

I have been asked to co-ordinate the revision of entries relating to speleology and karst for a new edition of the Glossary of Geology, published by the American Geological Institute. Please send suggestions regarding revision of the definitions in the 1972 edition, notes on new terms that have recently come into the English language, and comments and references to me at U.S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025.

George W. Moore

7th INTERNATIONAL SPELEOLOGICAL CONGRESS

The 7th International Speleological Congress will be held in Sheffield, England in September 1977. Main Conference sessions extend from 11 to 16 September and will include papers, meetings of the Commissions of the International Union of Speleology, business sessions of the IUS, excursions to the local karst in the Peak District, receptions, entertainment and a meeting of the 4th International Cave Rescue Conference. The 1977 Annual Meeting of the British Cave Research Association, hosts for the international conference, will be held adjacent to the main conference centre on the weekend of 10-11 September.

Pre and post Conference trips will be held in the Yorkshire Dales, the Mendip Hills and South Wales and to Co Clare and Co Fermanagh in the Republic of Ireland. Total costs for a full program including pre and post conference trips will run from about £170 to £250 (UK).

At least 6 Australians will definitely be attending and no doubt more will make up their mind shortly. ASF will be represented as a member at the plenary sessions of the International Union of Speleology by President Nick White and John Dunkley.

For further details write to:-

The Secretary
7th International Speleological Congress
B E C Travel Ltd
63 Dunkeld Road
SHEFFIELD S11 9HN England

The ASF President Nick White would be interested to hear from any member thinking of attending as soon as possible. His address? See inside front cover.

HERBERTS POT SURVEY

The Southern Caving Society has available enlarged photo copies of the Herberts Pot Survey. The size is 370 mm. x 630 mm. (14½" x 24" approx.). Price: \$1.50 each and posted within Australia in a mailing tube. Cheques should be made payable to "Southern Caving Society" and forwarded to P.O. Box 121, Moonah 7009, Tasmania. For those who don't know - Herberts is that b-i-g cave at Mole Creek.

"DISCOVER NARACOORTE CAVES"

The book "Discover Naracoorte Caves" by Ian Lewis is an outstanding publication produced by the "Subterranean Foundation", a group of South Australian cavers formed to publish speleo books of all types. This book is meant for the general public but is still a must for any caver's library as an example of a really good educational exercise. It is available from Ian Lewis, 12 McLachlan Ave., Glenelg North, 5045, Adelaide, South Australia. (Free plug - free copy? Ed.)

HANDY CAVING HINT (Western Caver Vol.16 No.4)

A certain well-known foaming cleanser (Greek Myths and Legends) is apparently also handy for erasing mistakes made while drafting cave maps on permutrace. A bit of the you-know-what, a bit of water and a clean rag has been found by laboratory tests to be more effective than the traditional methods of hair tearing, spitting, razor blades and general cursing. That eminent producer of cave maps, Barry Loveday, is to be thanked for this most useful contribution to speleotechnology.

ASF NEWSLETTER

Information has it that some cavers in some states, especially WA, are not receiving copies of this magazine. If you are one of these poor unfortunate souls and would like to do so, contact the Editor and arrangements will be made to get you a copy. I have also been asked to advise those clubs who have not forwarded their address lists to do so as soon as possible. Robin Steenson is handling these lists and can be contacted at - 10 Binda St; West Merrylands, NSW 2160.

FEATURES AND ARTICLES - ASF NEWSLETTER

Once again I am forced to ask any member from any club for contributions and/or articles. My supply at present is completely exhausted. Regular features such as "Down Under All Over" and "Who's Who" are needed urgently for the next issue. I have yet to hear from new member clubs and look forward to doing so in the near future. If you want a top rating Australian speleological magazine then I have to have the articles to put in it. So, how about spending half an hour or so and let me know what is going on!

SPELEO - GIGS

COMING EXPEDITIONS AND EVENTS

ATEA 78

Atea 78 is an Australasian Speleological Expedition to the Muller Range in the Southern Highlands of Papua New Guinea. The expedition is timed to occur in the dry season June to September, 1978. The main objective of the expedition is the exploration of ATEA KANADA (the Atea River Cave).

The Atea Kanada was discovered in 1973 (Papua New Guinea Speleological Expedition NSRE 1973), and is one of the most spectacular river cave systems in the world. In 1973 the cave was thought, by the expedition members, to be impossible to explore. A return visit by a small group of Australian and Papua New Guinea cavers in 1976 proved that this is not so. The Atea Kanada is a complex system with relict passages and floodways which enable it to be explored safely. To continue exploration of a deep cave with such a ferocious river is going to require exploration involving new concepts in underground communication, camps and rigging.

The Atea Kanada is three days' walk through mountains and rainforest from the nearest road and inhabited village. Therefore transport of equipment, personnel and the supply of provisions requires detailed organisation. The same organisation can serve a second purpose of supporting an extensive scientific programme of both surface and underground studies.

A committee has been formed of four scientists with Papua New Guinea experience -

Dr. J.N. Jennings	Geomorphology, Australian National University, Canberra, Australia.
Prof. P. Williams	Geography, Auckland University, New Zealand.
Dr. G. Hope	Biology, Australian National University, Canberra, Australia.
Dr. J.M. James	Mineral Chemistry, Sydney University, Australia.

The committee will be responsible for the design and coordination of a scientific programme for the expedition. Fields of study for which scientists are available and planning has commenced are, hydrology, mineralogy, geology, geomorphology, anthropology, microbiology and biology.

The expedition members will be selected mainly from Australia, Papua New Guinea and New Zealand. Where expertise is lacking or unavailable in Australasia, international speleologists will be invited to join the scientific programme in exploration.

CAMOOWEAL

A trip to Camooweal in mid to late August is being organised by Ken Grimes and Lex Brown. It is proposed to spend one or two weeks, possibly returning via Lawn Hill, Colless Creek, Griekfield or Undarra Lava Tunnels. Prospective members are asked to contact either of the above people as soon as possible.

SPAIN

According to information received, Guy Cox from SUSS, will be leading a trip to North Spain towards the end of August. If you are available and would like to participate, I'm sure Guy would like to hear from you as soon as possible. I do not know his address but contact can be made by writing to - Box 35, The Union, University of Sydney, NSW, 2006.

INTERNATIONAL SPELEOLOGIC MEETING, ANCONA, ITALY

The Speleologic Section of CAI (Club Alpino Italiano) Ancona, is holding an International Speleologic Camp from 10 - 20 September 1977. Included in the programme are trips to the caves at Senigallia, visits to interesting potholes in the Italian Marches Region and tourist trips to the most beautiful parts of the Riviera del Conero and the Marches hinterland. (It is interesting to note that the pamphlet states that all potholes are equipped with single ropes and ladders and that coming up and going down will be effected using self-holding, participants must provide his or her own descending apparatus and jammers). Unfortunately, the pamphlet was received only recently and applications close on 15 July.

W.A. CONFERENCE

The W.A. clubs have formed a subcommittee to organise their conference in January 1979. Present indications are that it will be a little later than previously, due to the high cost of labour over the Christmas-New Year period. P.O. Box 151, Nedlands 6009.

TAS. CONFERENCE

The Taswegians have also been busy. Accommodation is booked and only just in time. A venue is arranged and spaces on the ferry booked. Field trips are being planned in detail. January 1981.

N.Z. CONFERENCE

The New Zealand Conference seems to be under way but no details are available as yet. Expected time is Christmas 1979 - January 1980.

NEW PHONE NUMBER ASF NEWSLETTER EDITOR - 002 493842 PLEASE DISREGARD OLD NUMBER IT NO LONGER APPLIES!

LEVIATHAN CAVE - LAVA CAVE Cont;

Geologically, the cave exhibits some fine lava tube features. Not only are the passages of unusually large dimensions, varying from smooth ovals to high canyon-like areas often with 'key-hole' cross-sections rather reminiscent of vadose stream passages (which technically they are), but many lavatites and 'mites' abound. Large 'box-work' areas of sharp pointed 'tite blades' are common and the lower end of the cave contains a profusion of curly 'pipe-stem' varieties and weird lavamites built up of solidified lava pellet upon pellet. Lava columns are also present and some of an incredible blue-grey colour have been noted. Small ropey lava payments, often forming solid seals in small passages, were of a fascinating salmon-pink colour. Of particular interest are a series of unusual lava outgrowths on the edge of a bench which are dendritic in character and greatly resemble ferns. Burst blister formations were observed in both the walls and roof in certain passage sections, the former consisting of pockets surrounded by solidified jagged lava protuberances and the latter by deep pearl-shaped scoops where lava had trickled out at the lower end and down the walls. Long benches marked former levels of molten flow and in places coalesced to form natural bridges and tubes within tubes.

Secondary formations, probably of silica, were not common but of surprising length and beauty - a yellowish to orange colour being prevalent. Both stalactites and stalagmites (with some 'fried-egg' examples) and some long columns occurred.

Biologically, the cave was only briefly investigated, the capture of cave life being undertaken by the Expedition's zoologists. Three types of insectivorous bats were taken, species of Rhinolophus, Miniopterus and Hipposideros - the latter forming a large colony at the very end of the cave and being of an attractive orange colour - and one species of Rousettus fruit bat which occurred in many hundreds. Bat parasites, springtails, small flies, beetles, two varieties of cockroach and even some scorpions were collected. Of the cockroaches one small type is transparent, blind and apparently a cavernicole likely to be entirely new to science.

Many pottery fragments and some incomplete pots of two different decorative styles were found at and in the tunnel beyond Pottery Collapse and are thought to have been left by poachers.

During eight full days almost consistently underground, two teams tackled the survey of the great cave, often working ten to thirteen hours daily stints in order to complete the task during the time allotted. Excepting for many roof holes in the main passage line which almost certainly give access to additional upper levels which time and equipment did not permit entry, the greater part of the cave was completed revealing a total surveyed passage length of 11 km. A pretty impressive total. Total depth, by vertical range, came to 470 m. over the 8 km. distance from top to bottom 'end'. In addition, it was found that the tube in which the Advanced Base Camp was established was itself a braided upper level system with an estimated 1 km. of passages and a link with Leviathan is expected.

Survey instruments consisted of station staves, prismatic compasses, Suunto clinometers and steel tapes. Field data was programmed into a Hewlett Packard 65 pocket computer which has also been used to plot station co-ordinates onto the working survey drawing on a scale of 1:1000. In due course a full report on the cave is to be published in the C.E.G. Bulletin, Vol.6 and sheet copies of the full survey made available.

Expedition personnel consisted of the following C.E.G. members:

Jim W. Simons	(Expedition Leader - Hon.Chairman C.E.G. - ex. BEC. DSS. Westminster)
Bob Davis	(Leader Upstream Survey Party - ex. Imperial College Caving Club)
Graham Cole	(Caver/surveyor - ex. Chelsea)
John Youngs	(Caver/surveyor - Mountain Club of Kenya)
Peter Roe	(Caver/surveyor - ex. Orpheus)
Dr. Alison Hillman	(Zoologist/caver/surveyor - I.C. Catering)
Chris Hillman	(Zoologist/caver/surveyor - I.C. Cave biology)

The team was assisted by James Kitheko (Base Quartermaster) and three porters: Mutuku Mutinda, Mulatia Ngovia and Bernard Michael.

REFERENCE:

Simons, J.W., 1974. The Lava Caves of The Northern Chyulu Hills, Kenya.
Stud. Spel. 2 (6): 238-255

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DOWN UNDER ALL OVER - From Page 15

VSA Cont; only the second cave in the Potholes Area to have any reasonable horizontal passage initially of about 100 metres. At Warrnambool, several limestone and lava caves were entered. SW3 was surveyed and Guano Cave re-entered. This cave has an impressive 45 metre abseil. Parmure Lava Cave was also visited and several new caves were located. Lava caves at Mt. Hamilton and Skipton received visits and at New Guinea Ridge, Adrian Davey and Rudy Frank are continuing their study of this area and surveying in NG5. Visits were also made to Mole Creek and Indi. VSA will also be celebrating its 10th Anniversary at a dinner to be held in Melbourne. More on this later.

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WHO'S WHO.... on the speleo scene?

37. **guy cox**

Although a British immigrant, Guy is quite a tolerable person. His stature is relatively normal, although he is a Ph.D. microbiologist by profession. Guy and his Vincent 900cc are most frequently seen at Jenolan, although since his recent arrival in Australia, he has visited numerous areas in N.S.W. Guy has been president of SUSS for the last year, an even more rapid rise to fame than Randall King. His scientific interest in cave micro-flora & fauna at Jenolan has lent almost a speleological image to SUSS. Guy has caved in many areas around the world including deep caving expeditions to Spain. He has produced several speleo-publications and even a film on caves in Spain. Besides being a very competent vertical & wet caver, Guy is an exponent of the art of Spoonerisms which is quite a cunning stunt!

38. **lou williams**

Lou first went down a cave off the Glenelg River in 1964 but it wasn't until 1969 that he went down to Buchan with VSA. He is 29 years of age and a lithographer by trade. Lou's main interest in caving is exploration and a bit of surveying. It is in this aspect of caving that he is best known, finding new extensions in Scrubby Creek, Exponential Pot and as leader of the recent trips which have opened up Dukes Cave at Buchan. He was also part of the team which found the way on in Khazad-Dum back in 1970-71. Lou was also responsible for the development of the cave-ring descenders and has been vice-president of the VSA (1974-75) and a Director of Rimstone Co-operative (1975). He has done most of his caving in Buchan, Bats Ridge & Tasmania. According to recent information, Lou is now in Europe for an indefinite period.

39. **peter robertson**

Peter has been caving since he went to Buchan in 1962 with SubAqua Speleo Society (now part of VSA). Since then he has caved mainly in this area, along with Bats Ridge, Naracoorte and Bougainville where he was one of the first cavers to look at that area. One of his more memorable trips consisted of driving for 14 days to reach the Kimberly's, half a day's caving and then flying home. Peter is a member of VSA & CEGSA, past president of the former and a foundation director of Rimstone Co-operative Ltd. He is also currently Equipment Officer in the VSA and this is one of his main caving interests, "gadgets", mainly communications, surveying and photography. Exploration and cave diving are also included. Peter is 36, a medical electronics technician and single.

40. **gray wilson**

Gray commenced his caving in 1960 when he joined up with TCC. His first trip was to Maydena with Deefour Pot the objective. He participated in the first exploration of Mullamulang Cave and in 1965 left TCC to join SCS. Gray moved to Melbourne in 1970 and subsequently joined VSA. In 1975 he became S&R co-ordinator with VSA and is currently Convenor of Cave Safety with ASF. Married with a baby daughter, he was (on last reports) busily renovating an old house. By trade, Gray is an electrical trades teacher. (It may be of interest to note that some 20 odd years ago, Gray was my patrol leader in the boy scouts and a good one at that! Ed.)

Editor's Note: We need more identities for the next issue to continue this article. So far, we have only featured one female and I therefore ask 'women's lib' for a few contributions!

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REDUCING CAVE SURVEY DATA WITH A HAND CALCULATOR - ASF NEWSLETTER No.75

CORRECTIONS

- Page 6, line 11, should read '... overall co-ordinate change ($\Delta X, \Delta Y, \Delta Z$) of that segment ...'
- Page 7, equation 8, because of the gap in the equation it may not be obvious that S_{PQ} is multiplied by the remainder of the equation.
- Page 9, Table 1B, line 3 (second group) should read 'Segment data; D_S & ΔX_S stored ...'
- Page 11, line 17 should read '... The co-ordinate change (ΔX_n and length D_n) ...'
- Page 13, The second footnote to the bottom figure which reads '*Data stored by TAPE or ...' should be preceded by a '+' not an '*'
- Page 14, TRIANGULATION program, the first box of routine E. The equation for S_{QR} should be additionally multiplied by S_{PQ} (of equation 8 of the main text)

The above information was kindly supplied by the author, Ken Grimes. Unfortunately, due to an error on my part, a number of references were misplaced. They now appear overleaf.

REDUCING CAVE SURVEY DATA WITH A HAND CALCULATOR Cont;REFERENCES

- KING, R.; 1975 - A program for survey reduction on the HP 21 calculator. Bull. Syd. Univ. Speleo Soc., 15 (10), 210 - 11.
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- PAVEY, A.; 1974 - A program for the reduction of survey traverses on a Hewlett Packard Model 35 pocket calculator. Spar, 32, 2 - 3.
- RUTHERFORD, J.M., & AMUDSON, R.M.; 1974 - Use of a computer program for cave survey data reduction. Bull. Nat. Speleol. Soc., 36 (2), 7 - 17.
- SCHMIDT, V.A., & SCHELLENG, J.H.; 1970 - The application of the method of least squares to the closing of multiply-connected loops in cave or geological surveys. Bull. Nat. Speleol. Soc., 32 (3), 51 - 58.
- WILCOCK, J.D.; 1970 a - A review of computer hardware of particular use to the cave surveyor. Trans. Cave Resear. Gp. Great Britain, 12 (3), 201 - 209.
- WILCOCK, J.D.; 1970 b - Some theoretical aspects of the routine reduction of cave survey data. Trans. Cave Resear. Gp. Great Britain, 12 (3), 211 - 18.

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TO DIG OR NOT TO DIG

by Richard Willson

Digging is a popular pastime amongst many cavers, however, recently this activity has come under heavy fire from some of our most respected speleo's. The question is whether digging is really an ethical activity. What are the advantages and disadvantages of digging to the caver, to the scientist, to the public and most of all to the cave itself.

Detrimental Aspects of Digging (Direct)

1. Soil or rock removed from dig can be unsightly.
2. Creation of more dangerous shafts and holes (this is important in areas such as Bungonia which is frequently visited by tourists and other inexperienced persons).
3. Danger of collapse (especially with trenches).
4. Dangers and environmental damage arising from use of explosives in "digging".

Detrimental Aspects of Opening Up New Sections of Cave by Digging

1. Alteration of airflows, temperature, humidity and its resultant affects on cave ecology and formations.
2. Alteration of water flows and its resultant affects.
3. Opening sections of caves to further species of accidental troglobites thus altering cave ecology. (one species, troglobiticus neanderthalus, is especially harmful to cave ecology)
4. Vandalism.
5. Accidental vandalism (as done by all speleologists).

Advantages of Digging (Direct)

1. Diggers become fitter?
2. Psychological benefits of digging?
3. Pre-occupation of some cavers (while they are digging they are not destroying existing caves)

Advantages of Opening up New Sections of Caves by Digging

1. Increase of caving space available.
2. Status symbol to club/group/person who dug it.
3. Chance for those who dug out new section to explore previously unexplored cave (go where no man has gone before etc. etc.).
4. Creates a new place for boy scouts to exterminate themselves.

Possible Advantages of Opening Up New Sections of Caves By Digging (If Somebody gets off their - - -)

1. Documentation of the cave could help in argument for preservation against destructive influences (mining companies, main roads depts., dam builders etc.).
2. The room for scientific studies on newly opened caves are endless. N.B. Some studies could have direct advantages for cave conservation whilst others could be used in arguments against destructive influences.
3. Documentation could also lead to creation of overall pictures of cave systems.
4. Possible use of newly found cave as a tourist cave (remember non-tourist caves in tourist cave areas are perhaps the best protected caves in Australia).

TO DIG OR NOT TO DIG Cont;Discussion

With a lot of the advantages and disadvantages of digging at hand, we can now consider ethics. I think the ethics of the matter lies in two questions:-

- a) What are the motives of the diggers?
- b) Does it do the cave any good?

The motives of the digger rarely takes into consideration whether it does the cave any good, rather he is mainly concerned whether or not it will lead to new caverns and the chance to explore 200 metres of virgin passage. Unfortunately, there are some cavers who believe it is a good status symbol to find a cave by digging, ridiculous when you consider virtually any fool who is willing to dig long enough will probably find a cave (remember Portland Cement find a new cave at Bungonia on average once a week and they aren't even looking for them !!). Essentially, the motives of diggers have always been purely selfish ones with circumstances occasionally turning them to the advantage of the cave. Except in a few circumstances digging should be considered un-ethical.

However, like most things there is a catch!! If we, the speleological fraternity, make digging un-ethical it will not necessarily stop the practice of digging. Rather, it would stop responsible cavers from digging and would send irresponsible diggers underground. This would then put future cave discoveries in the hands of the irresponsible, which is ultimately more detrimental to the cave.

Conclusion

So, we have now decided that it is alright to dig to keep new cave finds in the hands of the responsible cavers. All we have left to do now is make sure responsible cavers act responsibly!!!

APPENDIXPossible Responsibilities of the DiggerWith Regard to Digs and Digging:-

1. The dig should be safe.
2. The dig should not be unsightly.
3. The dig should not harm cave ecology (underground digs).
4. The digger should be able to undo what he has done.

With Regard to New Cave/Passage Found by Digging:-

1. The digger should determine whether the cave should be resealed and how soon it should be resealed (a qualified second opinion would be advisable if doubtful). The digger should undertake to seal the cave if necessary.
2. The digger should assess the cave for possible scientific studies and take necessary steps to implement those studies. They should also take necessary preventive measures to ensure conservation of items of scientific interest.
3. The digger should document the cave (minimum requirements being; map the cave, describe the cave, describe location of cave (though this should not be freely disseminated; re ASF Code of Ethics Item 1. (c))).
4. The digger should take necessary steps to conserve the cave from vandalism (both accidental and deliberate) and destruction.
5. The digger should carry out all the above items as quickly as possible.

Possible Responsibilities of Cavers in General

1. They should try to discourage irresponsible persons from digging.

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DOWN UNDER ALL OVER...

news from around the societies.

BMSC : Greg Powell reports that so far this year BMSC has visited Bungonia for the Cave Rescue Practice weekend, Timor to inspect the caves around Glen Dhu under guidance from the Hills Speleo Club, Yarrangobilly in the snow, Walli, Cliefden, Abercrombie and Mammoth. Tasmania was visited by two members Karl Bilger and Brian Skinn and many underground slides were brought back for the rest of the club to ogle at. An attempt to reach Church Creek Caves failed when the group which had walked in from Kanangra Walls via Camboge Spire was halted at the Kowmung River which was in flood. However the bushwalk out and in was enjoyable. On a visit to Cliefden, David Dial illuminated the main chamber in the Main Cave with a generator outside the entrance. Beautiful effects were achieved on otherwise ordinary formations. Electric light makes a big difference. A memorial board of photos and text was installed on the wall of the Cliefden Hut as a memorial to Phil Coburn. A plaque is soon to be installed in the Main Cave. As well, members have been busy compiling black and white photos from Phil's collection to feature in a future issue of the SSS Journal. Under Barry Richard, survey work was continued above and below ground at Abercrombie.

DOWN UNDER ALL OVER Cont;

- CSS : Gordon Taylor reports that Easter saw another wet but nevertheless numerous water tracing experiment at Yagby. Despite the weather the experiment successfully bungled along under the supreme guidance of Messrs. Joe Jennings, "Dingle" Smith and Andy Spate. Members of SSS and UNSWSS were also involved in this exercise. Tracing was done with Rhodamine WT, which was placed in East Deep Creek and sampled for at Y44 and Y46. Andy Spate and Mary Coggon have the publication of the CAVCONACT proceedings well in hand and a first class publication is assured. (The best yet and it will be on time too)! CAVCONACT guidebooks are also still available. Several successful meetings to discuss the National Heritage Report have also been held. Recent trips include visits to Yagby, Buchan, Bungonia, Cooleman and Colong. Preparations are under way for CSS's 25th Anniversary in 1978.
- KSS : Neil Bannerman reports that KSS have been rather active over the last three months with work progressing well on the Halfway Efflux. It is now in about 3.05 metres and big enough for two people to work. Two digs have also been started in the top sink at Carrai Clearing but so far the effort has only been Shale Rock. A small party made a trip to the Bone Cave at Willi Willi recently being the first club members there for approx. 10 years. A search around the Crystal Ridge area near the Bone Cave yielded three new caves. Bushwalking has also been a busy part of KSS life with outings to the head of Kunderang Valley, Kemps Pinnacle and Windy Gap. A three-day trip was also made to the Tower Falls of the Hastings River.
- SCS : Ron Mann reports that in the seven months since the last report in DUAO the Society has been fairly active with eighteen trips including four trips to three new areas. At Mole Creek, Fred Koolhof has been photographing various caves in large format slides. Fred took his new Hasselblad camera on trips to upstream Herberts Pot, Croesus Cave and Shishkabab and his results are excellent. A number of trips to Mole Creek attempted to clear up some of the question marks remaining in the Mole Creek System but nothing new was found however the information gathered was useful in eliminating several of these question marks. The Christmas trip to Mole Creek was a very quiet affair and very little caving was done. Three Japanese zoologists from the National Science Museum in Tokyo were escorted to Entrance Cave by the President Michael Cole. Loons Cave and Exit were also visited by other parties during this period. Other areas visited by members were Flowery Gully, Loongana, Maria Island, Mt. Anne and the Franklin River. New areas investigated by the Society were Mt. Weld, the Cheyne Range and the Uper Loddon River. A number of holes were found on the south-eastern flank of Mt. Weld and the most promising is a shaft with a ledge at 50 metres where exploration stopped due to a shortage of gear. A return trip to the area has been planned. The Cheyne Range on the west coast NW of Mt. Gell was the object of a trip led by Kevin Kiernan. They attempted to reach a large depression visible on air photos but failed due to a lack of time. The party was extremely impressed with the scenery and alpine vegetation of the area. The Upper Loddon River area was also explored during the long weekend by a party led by Leigh Gleeson. They followed the Loddon River upstream through magnificent myrtle forest and then headed into the catchment ridges looking for a large doline shown on maps of the area. Thick vegetation in the headwaters hampered the group and they ran out of time before locating the doline. At the Societies AGM in April, Leigh Gleeson was elected President, Mieke Vermeulen as Secretary and Ron Mann, Treasurer.
- TCC : Tony Culberg reports that the re-survey of Exit was commenced over Easter with a gathering of experts not equalled for some time. Unfortunately, the weather delayed the start of the trip by 24 hours and not as much was done as was hoped. This project will continue for sometime and all visitors are asked to spend a day or two helping. Roy Skinner reports that NPWS has commissioned a report on the potential for tourist development of both Kubla Khan and Croesus Caves at Mole Creek. Maydena Branch members are active most weekends and 117 caves have now been numbered in the Junee-Florentine. JF 112 (The Slot) briefly looked at by John Minchin & Co in January has been re-visited by Maydena members and explored to a depth of 64 metres. It is still going strong.
- UQSS : Rosie Murphy reports that conservation problems have been a sorry feature again. A submission was presented by the Society regarding the limestone leases at Bracewell near Gladstone, while the problem of Mt. Etna is an ongoing one. In February of this year, the heavy rains in the headwaters of Pike Creek, submerged many of the caves, the water being unable to escape through the diversion tunnel of the dam. The water was down for the Freshers' trip but the mess bodes ill. This is the overall result of the Pike Creek Daming Project. Trips made by members include Jenolan, Nullarbor, Junee-Florentine, Mt. Etna-Limestone Ridge, Kempsey, and a lot of trip reports from the newly formed MICE (Mt. Isa Cave Explorers), who have been active at Camooweal and other places.
- VSA : Dave Smith reports that Lloyd Mill was elected as President at a by-election resulting from Adrian Davey's resignation and transfer to Canberra. There has been a general upsurge in the amount of speleo work being done resulting in quite a lot of surveying being completed in caves and areas right throughout Victoria. At Buchan, surveying in Dukes Cave eventually led into the Tourist Caves System and is progressing swiftly with several long, cold and wet trips being made in the last three months. Repairs to the Scrubby Creek Cave gate are in full swing and should be completed by now. Surveying in the Basin area is underway and an influx of CCOG cavers at Easter helped begin a survey of M19 and provided the initial manpower to dig through the rockfall of a new cave in the Potholes Area. This new cave, 'Stirlings Cave' is possibly the most significant discovery in this area since Exponential Pot. This cave was subsequently bottomed at about 50 metres and is

BOOK REVIEW

THE CAVES OF JENOLAN.

2: THE NORTHERN LIMESTONE.

Edited by Bruce R. Welch. Published by SUSS in conjunction with SRC Ltd. pp 132 1x 1976

When one is given a free copy to review one is in a cleft stick so to speak. Equally when a book evidences as much work as this, one feels one ought not to condemn the result. As far as the book goes, it is technically well made, the context is good and it is reasonably topical. It is without doubt an excellent text for the area.

There are, however, some complaints which may appear minor but are in fact of increasing importance, when the number of books of a speleological nature is growing and the market is not keeping pace.

- 1) The title page: There are four different type faces which do not appear to be consistently used. More to the point, upper and lower case letters are used in various places, with no consistency in application.
- 2) The numeral "2" in the title tends to confuse me. I have not yet determined what was "1".
- 3) The photos, while good, are set up in different ways, some have their top to the centre, others to the outer edge of the page. I thought it was normal to have the top to the left hand edge, thus giving consistency in the way the book is turned to view the pictures. Also there is no reference to them in the text thus their presence is of reduced value.
- 4) There is no index.

Some will regard these defects as minor. Speleology is old enough to now be in a position to produce well laid out books. I have no idea what the intended market is but if its the public then these minor defects damage the image of Speleology. In some ways, one would think the book was rushed through for the Conference market and that the quality suffered on the way.

I also doubt whether the general dissemination of information as this book and Bungonia Caves have both done, is in the long-term interests of speleology.

TONY CULBERG.

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LETTER TO THE EDITOR

A few rejoinders to Colin Killick's note on Mullamullang Cave (ASF Newsletter No.74, p.9).

First, for "SUSS" read "CEGSA". The publication, the extremely good map and the '66 Expedition and its attendant waste were all achievements of CEGSA although SUSS members greatly assisted and it was a SUSS expedition which discovered the cave in 1964.

Second, and this is more important - "The Dune, a pile of sand some forty feet high stands like a lonely hill, you can walk around it.". Yes, around it, not over it. This is an extremely rare and delicate feature which has as much right to protection as any speleothem. Keep off it.

Third, I am concerned that the general tone of Colin's article is to encourage visitation in Mullamullang. There is no control we can exercise on this other than persuasion, the remoteness of the cave and the requirement for a permit. However, Mullamullang is one of perhaps only 2 worthwhile candidates in this country for underground wilderness status and deserves better treatment and protection than it receives.

A few years ago Ian Lewis and I drew attention to the problems of Mullamullang and suggested some practical changes in attitudes and policy towards the cave. For full details readers are referred to the original sources but the following ground rules are recommended to all:

1. No underground camping
2. All rubbish, including human wastes to be carried out of the cave
3. No walking on The Dune or deviating from the established track through the sand between Southerly Buster and beyond Smoko Junction
4. No unnecessary crawling in the Easter Extension
5. All existing rubbish, including the historic elicits of the '66 Expeditions to be removed gradually from the cave

Times have changed since the 1966 trips and so should our attitudes. In 1978/79 a large number of cavers can be expected to visit Mullamullang on the way to or from the Perth Conference. It is the Federation's responsibility to draw up a code of behaviour so that members have the opportunity both to visit this, perhaps Australia's premiere cave, and as well be able to appreciate just how important is a policy for proper protection of its rare and delicate environment.

John Dunkley.

Postnote: The Editor received an apology from Colin Killick re his error but lack of space prevents me publishing it. Also - there is a new bridge in Exit Cave due to Roy Skinner, Tony Culberg and a number of others.