

S U S S

Journal of the Sydney
University Speleological Society

Volume 3

Number 1

JOURNAL OF THE SYDNEY UNIVERSITY SPELEOLOGICAL SOCIETY.

VOLUME THREE NUMBER ONE.

FEBRUARY 1956.

Journal of the
SYDNEY UNIVERSITY SPELEOLOGICAL SOCIETY.

Volume Three Number One. Feb., 1956.

CONTENTS.

	<u>Page</u>
Editorial	3
Federation of Australian Speleologists Brian J.O'Brien	4
Creek Tracing at Yarrangobilly Fred Stewart and Brian O'Brien	6
Kangaroo Island Expedition Tim Kirkpatrick.	8
Report of the Jenolan Sub-Committee Denis T.Burke	10
"Walkie-Talkies" in Caves Brian J.O'Brien	14
Northern Deep Creek, Yarrangobilly Ted and Jenny Anet	15
Rosebrook, Michelago and London Bridge Caves Ray Ferris	16
Two Extensions at Jenolan	17
"After-Glow" of Cave Calcite Brian J.O'Brien	18
Book Reviews: "Caves of Adventure" and "The Descent of Pierre Saint-Martin" Brian J.O'Brien	20
"Meditation on First Being an Oolite" Chris Wallace and Brian O'Brien	21
Speleology Abroad	22

EDITORIAL

The item of most general interest and importance at the present time centres round the formation of the Federation of Australian Speleologists, and this, as will be seen, is dealt with in a following Editorial article. It will be noted also that this journal contains reports by the Cooma Cave Club and, indirectly, by the Cave Exploration Group of South Australia, thus continuing the inter-society reports which should prove to be of such value once the Federation is formed.

The policy of severely editing cave expedition reports for publication in the journal has been continued - for instance, the very complete Report of the Jenolan Sub-Committee has been reduced to about one quarter of its full length. It is felt that such editing is necessary for two main reasons - firstly, for reasons of space, and secondly to summarise caving activities into such a form that they will provide a moderately complete report of discoveries, without including details which can only be of interest to those who follow in the footsteps of the explorers. However, it is pleasing to note that the reports submitted by various expedition leaders are still aimed at being complete reports, which can be consulted by those interested. Evidently the editing has not reached the stage foreshadowed by a former SUSS President that contributors will complain they have been quoted out of context.

B.J.O'B.

FEDERATION OF AUSTRALIAN SPELEOLOGISTS.

The desire to raise the standard of speleology and to increase cooperation between speleologists in Australia led to S.U.S.S. broaching the subject of a National body to the various groups known to us late in '54. The Hobart Caverneering Club, the most senior Australian caving group, expressed its support of the idea, and, in time, S.U.S.S. and the newly-formed Sydney Speleological Society were able to meet to discuss various aspects of the proposal.

From these meetings sprang a joint circular to societies in Cooma, Canberra, Hobart, Mt. Isa, Orange and South Australia indicating points of basic agreement between SUSS and SSS, and requesting further suggestions and comments. The five points of agreement were rather broadly phrased, and may be summarised as expressions of a desire for cooperation both in active local caving ventures and in speleology in general, and a consequent desire to improve Australian standards.

After some time, very pleasing letters were received from South Australia, Canberra, Orange and Hunter Valley (the latter was not known to us at the time of the circular), and together with early letters from Hobart and Cooma, these have led to a firm belief that formation of a National Federation is only a matter of time.

Recently the two Sydney societies met again, and a further circular was written, which summarised all suggestions received, together with various comments by the seven societies. It was suggested in the circular that any further suggestions be submitted before 31st March, as shortly after that date it is planned that a draft Constitution, based upon all points of general agreement, be circulated.

All societies expressed approval of the basic points outlined in the first joint circular, while showing an awareness that the question of degree of local control will require careful consideration. General opinion has favoured a central reference index as part of the hoped-for mutual cooperation. Subjects of further discussion were - search and rescue groups, safety codes, map and report standardisation, membership and control criteria, and general Conventions. On the latter issue, the C.E.G. of South Australia envisaged the inaugural Convention as being held in conjunction with a Nullabor expedition after Christmas, '56, to which various groups have already been invited. If a number of difficulties necessarily associated with a Nullabor expedition can be solved (and the C.E.G. has had previous experience in doing so) the prospect will prove very attractive.

Thus the situation in February, 1956 is that general approval and support of the proposed Federation of Australian Speleologists have been expressed by

Sydney University Speleological Society (Box 35, the Union,
University of Sydney.)

Sydney Speleological Society (114 Boundary St, Paddington, N.S.W.)

Hobart Caverneering Club (15 Deviation, Battery Point, Hobart,
Tasmania.)

Canberra Speleological Society (Box 35, G.P.O., Canberra, A.C.T.)

Cave Exploration Group (S.A.) (c/- S.A. Museum, North Terrace,
Adelaide, S.A.)

Cooma Cave Club (26 Orana Ave, Nth. Cooma, N.S.W.)

Hunter Valley Caving Club (c/- Land Boards Office, Box 6, P.O.
East Maitland, N.S.W.)

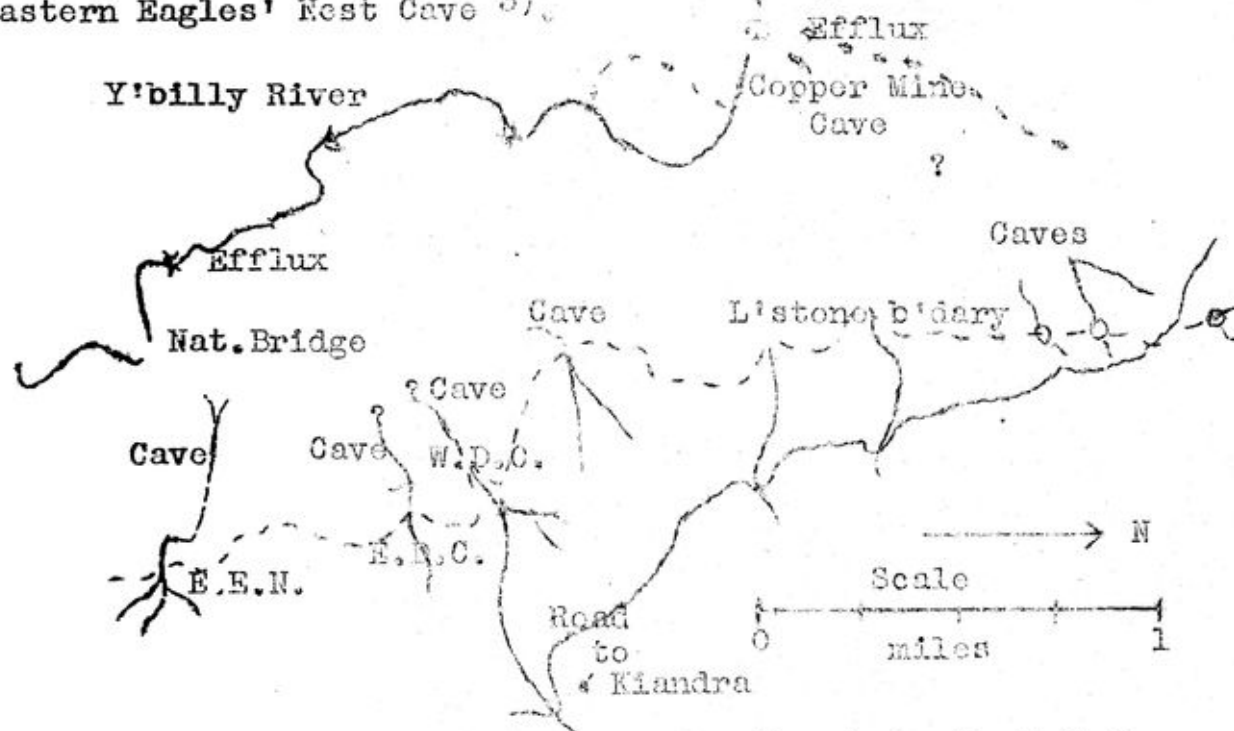
Orange Speleological Society (38 Autumn St, Orange, N.S.W.)

It is my feeling, and my hope, that with a basis
and the backing of these Societies, the Federation will thrive
mightily.

Brian J. O'Brien.

CREEK TRACING AT YARRANGOBILLY.

Over the last few years, the writers have spent much time in exploring and studying the Yarrangobilly cave systems, in particular the two sets of caves known as the Eagles' Nest (E.N.) and Deep Creek (D.C.) Caves. In Figure 1 is given a sketch of the Yarrangobilly limestone plateau, and the development of the known caves beneath it. A number of reports have been published already dealing with the caves themselves ^{1,2} together with a map of the Eastern Eagles' Nest Cave ³.



It will be seen that creeks flow into the E.E.N., and the E.D.C. and W.D.C. Caves. Further, an efflux is noted at the base of the Y'bilby gorge, emptying into the Y'bilby River a volume of water greater than that of the three creeks combined. This latter could possibly be explained as being groundwater plus one (or more) creeks, but we have held a hope for some time that the three creeks have this common efflux, and at least some portion of common cave.

Accordingly, in August '55 Stewart and Kirkpatrick reached Y'bilby, after some difficulty due to flooding of the Tumut River and snow blockage of the Kiandra road (the latter effectively prevented O'Brien and Lehané from reaching the caves.) Due to melting snow all rivers and streams in the area were high and a large amount of water flowed into the three caves.

One pound of fluorescein was mixed with a gallon of water and emptied into the creek near the E.E.N. cave entrance at 6 a.m. After descending to the Y'bilby River a watch was kept, particularly on the efflux already mentioned. At 2 p.m. the

water in the efflux started to change colour, and by 2.30 p.m. it was a definite lime-green. The dye therefore took 8 hours to traverse the underground portion of the creek; the difference in level between inlet and efflux is 400-500 feet, and they lie about 2/3 mile apart.

Temperatures were found to be (at 8 a.m.) :

Eagles' Nest Creek	: 43° F.
Air and still water in E.E.N. Cave	: 45° F.
Water in efflux	: 45° F.
Air near efflux	: 34° F.
Y'billy River	: 41° F.

In October, '55, a further expedition was made to test the Deep Creeks. (Party members: O'Brien, Stewart, Wallace, Hunt, Bishop, Crook and Draper). Fluorescein (again one pound) was placed in E.D.C. just above the cave entrance at the bitter hour of 3 a.m., and at 8 a.m. O'Brien and Stewart descended the gorge to the river and the efflux, and kept watch there, and upstream. On the way down the gorge, a slight accident to one of the two rendered medical attention more than merely desirable, and hence the watch was abandoned at 2.30 p.m. without any colouration being detected. For the same reason, examination of the river for 1/2 mile upstream was rather cursory.

Thus the position as it stands at present is the following: the Eagles' Nest efflux is known, and is the expected one. The test on the Eastern Deep Creek was inconclusive, and merely showed that a wait of much more than 12 hours will be necessary to disprove our hypothesis. The West Deep Creek is not yet tested, but further work will be carried out in the future. One further fact worthy of note is the existence of a powerful blow-hole through a mud-rock crevice at the end of one section of the E.E.N. Cave (this lies about 600 feet past the point "E" and near the rock-pile as marked on the map by O'Brien and Stewart.

References:

- 1) MacGregor, P. : SUSS 1, 2, p.10 (July, '52)
- 2) O'Brien, B.J., and Stewart, F.E.: SUSS 2, 1, p.15 (Jan. '55)
- 3) O'Brien, B.J., and Stewart, F.E.: SUSS 2, 1, pp.44, 45.

Fred H. Stewart and Brian J. O'Brien,

KAEFGAROO ISLAND EXPEDITION.

Christmas, 1956.

by the Cave Exploration Group of South Australia.

Party members: David Taylor, Alan Hill, Bob Sexton, Roger Textor, Noel Mollet, Darryl Morgan, David Chimner, Bob Varney and Tim Kirkpatrick.

The landscape along the southern portion of the island is sandy, open and flat, covered only by scrub, while from the geological survey sheet it appeared that limestone is spread over a great area. Kelly's Hill, the site of a tourist cave, looked no more spectacular on the surface.

The layout of the officially recognised cave is roughly V-shaped, and one small end is open for tourist inspection at 3/6 a pop. The old entrance at the far end consists of a 19 foot vertical hole, surprisingly smooth and uniform around the walls with a layer of calcite. The present tourist entrance has been blasted in.

The system had not been methodically explored prior to our arrival. Local residents had spasmodically roamed about during the last fifty years but virtually no records were to hand, save a short traverse put through the old tourist section.

New extensions were found in various places, radiating out in most directions from the old and new tourist caves. Three other entrances to the system were found by underground exploration while searching on the surface was made more difficult due to scrub and that South Australian quantity, Bigger-Bush. Briefly, the interconnections of these three holes with the tourist section enlarged the known system three-fold.

The mapping undertaken was a more detailed completion of the traverse in the tourist section and the location of the explored extensions. Exploration was mainly directed by Hill and Sexton who were doing the mapping. They first did a surface traverse tying in many known holes on the way. The underground readings were then plotted at the conclusion of each job in facilities provided by Doug Seton, the Caves Caretaker. Hence the growing map continuously gave us valuable directions for exploration and resulted in fast interconnection.

Most of the caverns were domed structures, the shape of the roof resembling that of the floor, with a remarkably constant vertical height in each chamber varying a little from one to another. Unfortunately, the caves are not a pleasure to work in due to the crumbly nature of the sandy limestone. Chunks of it are liable to break away without much provocation. However the cementing action of the pure limestone removes this danger when formations are present.

Perhaps the most outstanding cavern is the "old" Midnight Cave. Here the range of formation is most versatile in both type and size. Very notable are a "totem pole", 3 feet high and about 6 inches general diameter, and a huge crystal-clear helictite. The cavern is really well covered in formation, the embellishment being completed by the presence of about eight very fibrous tree roots, draping 15 to 20 feet to the floor.

Besides the exploration and mapping, the speleological work was carried out under the direction of Dave Taylor. In this field, the discovery of many types of bones have yielded much of interest. On the spot identification was made of the Tasmanian Tiger Cat, not previously known to have ever existed on the Island. In addition, the collection of insects down below was made for the Adelaide Museum. (We did not applaud the last minute revelation on the boat to the Island that the meat to be used as insect bait had to be left to ripen in a cave for a week.)

An allusion should be made to the Sand-dune Theory to explain the unique formation of the caves. It was derived by Hill and Taylor from many long and intensive periods of discussion. Further reference to the genesis of the system should be made to the C.E.G.'s first report on Kangaroo Island.

Although much more mapping and exploration have yet to be done, a good foundation from which to work has been laid already. Hill's previous knowledge of mine surveying together with Sexton's professional knowledge has resulted in a very sound survey to Grade V standard. These two are very eager to see uniformity of scales, notation etc in Australian speleological surveys.

The future prospects of the caves are good. The whole hill is riddled with pot-holes that have not been investigated. However, there is a possibility that these may not be very extensive, since the numerous conical depressions in the ground indicate poor stability in the area, and a couple of holes already investigated proved to be blocked-up. Yet a break-through in one of these holes to decent-sized caverns has excellent prospects and this area is worth the pleasure of many more expeditions.

Our thanks are due to Doug Seton, the Curator of Kelly's Hill, for his keen assistance and for the provision of facilities for us.

Tim Kirkpatrick.

REPORT OF THE JENOLAN SUB-COMMITTEE.,

1954.

S.U.S.S. Report No.54.

A detailed report of work carried out in '53 and '54 in the Jenolan area has been prepared, and the full text and maps are available from the Society Library. The following is a summary of this report.

Caves upstream from the Mammoth.

The publicity attendant upon the first diving trip in '53 led to Fred Diggins of Kurrajong Heights contacting the Society about an extensive cave upstream from the Mammoth Cave, which had been discovered in 1908. The cave entrance was in the foot of a prominent bluff on the western side of the creek, and the cave was said to be very extensive and to contain a large lake.

A S.U.S.S. expedition led by Bruce Cobbin found an entrance leading from a depression at the edge of the silt plain about 150 yards from the Bushranger's Bluff. About 40 feet along a horizontal passage was a 12 foot drop, and the cave then branched into two-one section ending after 150 feet, the other after 200 feet after Ian Driscoll and Dottie Neill had excavated three squeezes. Further excavation has been done, but with little success (the site was, of course, very soon dubbed Diggins' Diggin's.) Mr. Diggins has stated that this was the cave he entered in 1914 thinking it was the "very extensive" one, but it need not be the one discovered in 1908.

The search drew attention to other caves upstream from the Mammoth. Cinclair's Cave, $\frac{1}{2}$ mile upstream from the Bushranger's Bluff, is entered from a sink. A long muddy passage has, at its end, the inscription Sinclair 1895. The cave is featureless. The Collapsing Cavern was entered from a sink. Dislodgement of a small rock touched off a general collapse of the roof, and the cave is unsafe to enter.

The Serpentine Cave is entered through a pot-hole at the foot of Bushranger's Bluff, and was opened by Darryl Morgan and Ted Faunce. After 40 feet the serpentine effect began in a narrow passage with smooth rippled walls, there being an abrupt change in direction every ten feet. Dottie Neill has opened up a cathole 200 feet in, but the cave now ends in a vertical shaft choked with rubble. This is about 35 feet below the outside creek level, and since the cave is obviously a flood water channel, it may prove valuable to excavate down towards the underground river level.

Generally speaking, the caves found to date beyond the Mammoth are horizontal mudtunnels with little or no formations, but there are other sinks which could be investigated with an aim, as in the Serpentine, to penetrate down to the underground river.

The Mammoth Cave.

In preparation is a detailed map by Barry Mason which should clarify a number of puzzles in this cave. It appears that the Central Level goes predominantly northwards while the Lower Level and extension head directly south, and also that there appears to be no interweaving of passages and thus scaling work will not lead into already known sections. A general sketch map was compiled by Peter Fielding and others several years ago, while a map of portion of the Central Level was made by Noske and Welch in 1943. Brian O'Brien and Fred Stewart have carried out a survey of the Lower Level (July, '53) and have shown that the main entrance and the River in the Lower Level lie 212 feet vertically apart.

There are four known entrances to the system - the main one, two downstream from this, and the Bow Cave, a shallow sink 100 yards upstream, which was deduced by Fielding to link with the Central Level. Mason's map supports this view, but at present the linkage appears to be blocked.

In January, '54, Colin Blundell and John Bonwick, by use of a scaling pole, discovered the interesting Fire Cavern in the roof of the Upper Level. Although both ends were formerly virtually sealed, the floor is covered with about one inch of what appears to be charcoal.

Two fluorescein colouration tests have been carried out. The first of these (Brian O'Brien and Fred Stewart ¹) proved that the underground river is the same stream that flows into the Imperial Cave and the Blue Lake, about one mile away. The second (Barry Mason ²) indicated that the Central Level River may be a tributary of the Lower Level River somewhere downstream.

In 1938 a party which included Quentin Bourke actually cracked the siphon in the L.L. River which, at that time, was partly open. The party negotiated a second siphon but the third was fully submerged.

Caves downstream from the Mammoth.

The Playing Fields' Cave ³) has been reported already, as have the Frenchman's and False Frenchman's (also called the Ladder) Caves ⁴). A map of the F.C. was made in April, '53 by Dowden, Wallace and Friedman, and of F.F.C. by Dowden, Stipl and Bishop at Easter, '54.

The Roost is a small hole in the cliff-face just downstream from False Frenchman's, being 200 feet from the plateau and 100 feet above the valley floor. It was abseiled into by a party under Ron Wardrop, but proved very small. Two small caves

on the eastern side were entered by Bruce Noble and Ben Nurse, and Denis Burke. The first is rather dangerous, while the second is quickly blocked by debris. Several holes exist about creek level in this vicinity, but they are believed to be blind.

The Aladdin Cave was discovered in 1895 and opened for the tourist who wanted something a little more rugged than the Imperial. (A new section is reported elsewhere in this journal.) The Rho Hole was named in 1950, but was known by 1880. The entrance is near that of the Aladdin, and after a few slides, a descent of nearly 100 feet is made through a chimney. The terminal section is known as the Mulberry (or Blackberry) Tunnel. (See also this journal for report of a new section.) The Glass Cave was found by John Bonwick and others to have a very beautiful extension and a description has been given elsewhere. 5)

Work in the Tourist Caves.

The Jubilee Cave.

The Report of the Mines Dept. for 1895 contains a very brief account of an early exploring party which had found a way down, via an offshoot passage at the start of the Water Cavern, over broken rock to the underground river, 100 feet below. In September, '53, a party under Fred Stewart found this passage, only to discover it to be blocked by a rockfall at an obvious funnel in the floor.

In July, '53, the siphon at the end of the Water Cavern was found to be quite dry, and from then till the following January, digging was carried out under Burke, Bonwick and Dowden in rather difficult and very muddy conditions. In February, after heavy rain, the siphon was flooded again, and work has never recommenced.

The most important event of 1953 at Jenolan was the diagnosis of an impending rock-fall in the Exhibition Chamber in the Lucas Cave. It appeared that a large flat rock, weighing about 100 tons, was on the point of sliding down a 60 foot and 45° slope, and Mines Dept. experts estimated that the rockfall from behind would involve a further 20,000 tons of loose rock, including that supporting the Broken Column. A party under H. Fairlie-Cunningham investigated the position at the request of the N.S.W. Govt. Tourist Bureau, and found that the rock was pivoted at a few points, and was gradually forcing a smaller rock in front forwards. Movement at this point has been observed at intervals over the last fifty years, and portions of the tourist paths are cracked and broken. To measure any further slide, a marker was fixed to the uppermost extremity by sinking a bolt into the rock and passing wire over a pulley attached to the roof. Movement of a suspended weight could be read on a scale.

As the threatened rockfall was endangering the passage to the caves beyond (Orient, River, Skeleton, Ribbon and Temple of Baal) these caves were closed off to tourists. Subsequently work was begun in April, '54, on "Binookea Cut", a tunnel to link the Orient and Temple of Baal with the surface, and this is now substantially completed.

Temple of Baal Extensions.

The communication with the surface of a long low passage beyond the Temple was proposed by Edric Slater following his discovery of animal remains there. A great deal of work associated with this problem and the proposed access tunnel has been done in the system since 1953.

Denis Burke, John Bonwick and Ben Nurse have carried out much excavation and associated exploration, while Dik Dowden, Chris Wallace, and also Harry Pemble have been responsible for a series of accurate surveys which have greatly extended knowledge of the system and facilitated an access tunnel through the Dragon's Throat. Full details and maps are available in the S.U.S.S. Library.

References:

- 1) Burke, D.T.: SUSS 2, 2, p.19 (May, '55)
- 2) Ibid.
- 3) Fairlie-Cunninghame, H.: SUSS 1, 2, p.8 (July, '52)
- 4) Ibid.
- 5) Bonwick, J.: SUSS 2, 1, p.20 (Jan., '55).

Denis T. Burke.

.....

Eastern Eagles' Nest Cave, Yarrangobilly.

Owen and Myra Llewellyn of S.S.S. have reported that they observed a large, fresh rock-fall on the northern side of the first large cavern in this cave when they visited the area in January, '56. The exact date of the fall is not known, but it had not occurred by 20th December, when Stewart, Wallace and O'Brien were at Yarrangobilly.

.....

WALKIE-TALKIES IN CAVES.

SUSS Report No. 63.

4-12-'55.

Party members: B.J.O'Brien, C.S.Wallace, L.Bishop, A.Hunt, T.Draper, J.Lehane, J.Walker, and members of the V.H.F. Group of the Wireless Institute of Australia, led by Perce Healy.

The testing of walkie-talkies and radio-transmission within caves has been of interest to us for some time, but it was impracticable to carry out tests until the V.H.F. Group of the W.I.A. kindly provided facilities and equipment which permitted satisfactory experimentation, using 144 megacycles.

The equipment comprised four walkie-talkie units with input to the final stage of 0.4 watts, and two mobile units running 6 watts input, with one of the latter having a fairly selective directional antenna. General ease of access and facilities caused Jenolan, and in particular, the Glass and Orient Caves to be selected for the experiments.

The first tests were carried out in and into the Glass Cave, which is about 150 feet above the valley floor, and which goes, via several narrow holes, almost straight into the hill-side. A cavern, 20 x 20 x 50 feet, was the first station, and signals to and from it and a mobile unit 1/3 mile away on the valley floor were stronger than with the mobile unit and a walkie-talkie at the entrance to the cave. It appears that the signals were transmitted through about 700 feet of limestone and 1000 feet of open terrain between the two stations, and they came through "loud and clear."

Signals from the first station inside the cave were stronger at the base of the hill outside than they were at the entrance, and this cannot be fully explained without a more detailed knowledge of what lies between. Intra-cave communication was tested for separations up to 100 feet, through small and winding ways, and was found to be quite satisfactory. The car transmission was also detected right inside the cave. Signals seemed to be best when received in a sizeable cavern, and this is a feature requiring further testing. The only theory I can devise which would seem to be feasible is that the change of dielectric constant (effectively of the refractive index) in passing from limestone to air causes a cavern to act as a focussing lens, with the cross-section offered to the radio-beam defining the aperture of the 'lens.'

One mobile set was later stationed outside the tunnel entrance to the Orient tourist cave, about 50 degrees from the line of the straight tunnel, and a crystal-controlled walkie-

talkie taken inside. Along the 400 foot long tunnel reception was fair, and the directional antenna of the mobile set followed the directional changes along the tunnel and into the cave. In the latter, wire netting from the tourist facilities provided shielding at a number of points. In a small cavern, about 400 feet from the car in a direct line, reception was fairly good, but in a further cavern about 70 feet wide and 50 feet high, reception was very good.

Further tests, including directional cross-bearings from about five external points, and intra-cave work of up to 1000 feet separation, will be carried out as this journal is printed, and more attention will also be paid to the effect of cavern size upon reception. It is somewhat early to draw general conclusions, but it seems likely that 144 Mc/s will prove extremely useful in inter- and intra-cave communication.

Acknowledgements:

Thanks are gratefully given to Bill Woof of SUSS, and Perce Healy of the W.I.A. for making these tests possible and cooperating so well in them.

Brian J.O'Brien.

.....

Northern Deep Creek Cave, Yarrangobilly.

Ted and Jenny Anet have reported the discovery and exploration of a new cave situated about one quarter of a mile north of the Western Deep Creek. The system consists of four entrances in a valley which links with the old Deep Creek valley 'downstream' from the entrances, and a creek disappears at the N.E. end of the easternmost sink.

It was possible to fully examine only one entrance, which lay in the above sink, and led into a very deep rockfall that sloped down to where a ladder descent of 18 feet reached the creek bed. This was followed down for 600 feet (measured by a rope) to a siphon, and since it bore W. of S. it reached about halfway to the West Deep Creek sink. The section contains fair formations, fine flowstones and some pockets of oolites, and has no sign of previous exploration past the ladder drop.

Party members: Ted and Jenny Anet, Don Adamson, Heather McLaren, Pauline Hiscox.

SUSS Report No.66. Jan. '56.

Ted and Jenny Anet.

ROSEBROOK, MICHELAGO & LONDON BRIDGE CAVES.

Reports by the Cooma Cave Club.

Party members: Hugh Myers, Bruce McPherson, Harold Gregory, Tony Reed and Ray Ferris.

Rosebrook Caves.

The caves are situated 5 to 7 miles N.E. of Cooma and 3 miles E. of Bunyan railway station. The limestone belt was first recorded by Anderson in 1889, and Leigh in 1893 estimated the outcrop to cover four square miles. A general report is given by Trickett in "Limestone Deposits of N.S.W."

Five expeditions to the area resulted in the exploration of three principal caves. The first two are in the nature of pot-holes and are less than fifty feet in extent. However, the third cave, which has been named the Coral Cave, is more extensive and has an intricate network of passages. Most of these tend towards the surface before being blocked, and it would appear that in the system one cavern 40 x 20 x 50 feet is the meeting place of many small streams. About 100 feet from this cavern is another which is somewhat smaller, but is a mass of formations of many types and colours, including a wondrous coral formation about two feet high and two feet wide, which is pink in the centre and white outside, with edges like delicate filigree.

The fine coral floor of the last cave showed this to be the first time it was entered. It would seem that more investigation could be carried out towards finding a lower level, since the caves run in a northerly direction towards an external permanent spring.

.....

Michelago Caves.

Map References: Military Survey, Michelago West, 1 mile series, 156907. Location: $1\frac{1}{2}$ mile N.S.W. (magnetic) of Micaligo Ck. Bridge.

The caves are on the right bank of the Murrumbidgee River, in an outcrop 60 chains long and 25 to 50 yards wide. There are many holes on the western side, leading into caves none of which is more than 30 feet long. The action of wind and sand has apparently been responsible for the smooth polished floors and walls of the caves.

The area is geologically interesting, and several bones of a Giant Kangaroo, a wallaby and water rat of the Pleistocene age were found in a sink, but there is little of

interest for the cave explorer. However, Trickett's report indicates that there are several outcrops, both up- and downstream, which warrant investigation.

London Bridge Caves.

Location: 7 miles N.E. of Burra, a homestead 6 miles E. of Royalla. A track, just negotiable by car, goes to about $\frac{1}{2}$ mile from the caves.

The London Bridge Cave itself is a natural bridge through which the creek flows, and is about ten feet high, thirty feet across and seventy feet through. Two caves, one each side of the arch, may lead through to two holes in the roof but lack of equipment prevented a check on this. Some other holes have been found but none was very extensive.

Ray W. Ferris.

Two Extensions at Jenolan.

On 12/6/58, a SUSS party under Adrian Hunt, in cooperation with speleos from Newcastle Technical College, entered a fine extension in the Aladdin Cave. Access to the extension is through two tight squeezes, the first penetrated by Rex Filson of Newcastle, and this was called Filson's Folly, to commemorate the six hours excavation necessary before he could return through it to the rest of the party. Formations in the extension are generally superior to those found in the older portions of the cave. A survey of the cave has been made by Hunt, Bishop and Draper.

A small extension to the Rho Hole was found by a group led by Ted Faunce on 9th April, 1958. Entrance is made by climbing up for about 30 feet above the Mulberry Tunnel, and the new section contains varied formations finer than those formerly known in this cave.

Members of S.S.S. have succeeded in establishing a junction of the Fossil Cave and Hogan's Hole at Bungonia. The combined system is now probably the largest known in the area, and linkage was achieved only after much difficult excavation. Further excavation and blasting on a grand scale are in progress at the efflux near the gorge, but work is extremely difficult.

THE "AFTER-GLOW" OF CAVE CALCITE.

For some years, cave photographers have come forth from their activities bringing tales 1) of crystal formations which glowed brightly for a few seconds after irradiation from a flash-bulb or -powder. Doubt has often been expressed that this effect is anything but an after-effect of the bright flash on the retina of the observer.

A number of calcite samples were procured by the author from various parts of Jenolan and Cliefden Caves. These were inspected under ultra-violet, and the "after-glow" established beyond doubt for several specimens.

The crystals were scanned by a shuttered photomultiplier (R.C.A. type 1P21) which was used to trigger a Tektronix oscilloscope. The decay of the light pulse when irradiation ceased was then clearly seen on the oscilloscope screen, and found to drop to one third of its initial strength in one quarter of a second. The logarithmic response of the human eye results in the glow being visible for two to five seconds.

The luminescence under 2537 Å⁰ irradiation was generally blue-green, but one sample glowed orange-red. The strength of the after-glow varied greatly from specimen to specimen, and two samples from the Temple of Baal, Jenolan, gave no visually detectable glow. The strongest glow came from a single clear crystal of about 20 c.cs. which was found at Cliefden.

A spectroscopic analysis of this crystal was made to a sensitivity of better than one part per million, and the result was rather overwhelming. Traces of the following elements were found: Manganese, Iron, Silver, Copper, Aluminium, Strontium, Barium, Magnesium, Potassium, Sodium and Silicon, with a faint trace of Lithium. The Manganese was present in appreciable quantities, but no quantitative measurements have been made as yet.

The Luminescent Process and "After-glow."

If one follows the conventional concept of an atom as a central nucleus surrounded by orbital or planetary electrons, one may see that an electron may accept the energy of an ultra-violet photon and jump into another orbit, and after a certain time, return to its initial orbit, giving out a flash of "visible" light as it does so. The electrons may take some time to make the second jump, and thus one sees an "after-glow". The quality of the two energy transfers depends on the atomic lattice and set-up of the substance, and in some cases it is necessary for an

extraneous atom (an impurity) to be present before the jumps can take place.

It has been shown ²⁾ that pure calcite shows no luminescence. However, the judicious addition of certain impurities - Lead, Thallium, Cerium and Manganese have been reported - to the precrystalline solution to the order of a fraction of a percent concentration results in luminescence upon radiation by 2537 Å⁰ ultra-violet ³⁾. It appears that the addition of manganese alone will not result in a strongly luminescent crystal, and a second or even a third impurity is necessary.

Conclusion.

Small concentrations of Manganese, in association with one or more of the listed elements, will result in calcite crystals being fluorescent with a decay time of one quarter of a second. The fluorescence may be blue or red, and an "after-glow" will be visible, in general, for a few seconds. The phenomenon is perhaps not as rare as customarily thought, but may be of greatly varying intensity.

References:

- 1) M.Sutherland and E.Helm, Mat.Geog.Mag. CIV p.452 (Oct.'53)
- 2) H.Leverentz. "Luminescence of Solids" p.340 (1950)
Wiley & Sons, N.Y.
- 3) J.H.Schulman et al. Journ. Appl. Phys. 18, p.732 (1947)

Brian J.O'Brien.

.....

Woof's Cavern, Colong.

Following the brief note on this cavern in SUSS 2,2,p.22 Jack Cummings has submitted a further report on his work there including two maps in an endeavour to ascertain whether the access passage discovered by him is indeed the one blocked by a rock-fall (he is now stationed in Victoria and is unable to make a personal check.) From this report it appears that it is still possible that the passage is open, but a check will be made when possible.

.....

BOOK REVIEWS:

"Caves of Adventure" by Haroun Tazieff,

15/-

"The Descent of Pierre St. Martin" by Norbert Casteret. 22/6

Both these books are concerned primarily with the exploration of the Gouffre de la Pierre Saint-Martin, the great cave system on the French-Spanish border, which has an initial vertical shaft of 1135 feet, and extends below in a series of enormous caverns. Both books, too, have as their keystone the tragic death of Marcel Loubens, who fell when ascending the shaft. But here similarity ceases, since Tazieff was a relative novice (the same shaft the previous year was his first venture into caving) while Casteret, as is well known, has been caving for more than thirty years.

This difference of experience is reflected in the tone of each story. Tazieff tells his tale, of the first expedition in '51 and the second in '52, of Loubens' death, of his own subsequent exploration of a huge cavern, and of his trials in the final ascent, with a touch of bitterness, both against what one may term Fate and against various lapses in organisation of the second expedition. But he does give an indication of the early effect of saving upon him - "So it's got you, the pot-holing virus" Loubens chaffs, and Tazieff replies "It certainly has." As a contrast, Casteret continually displays a mood of acceptance of events as they occur, even when one event is the death of Loubens, his protege and close friend.

After the death of Loubens, two more expeditions to the cave were made, in '53 and '54. These are described by Casteret, who played an active part in each, and he relates the difficulties of the '53 expedition, which finally resulted in victory, as a record depth of 2,389 feet was reached, with caverns such as the Salle de la Verna, 660 x 400 feet, with a height of nearly 330 feet.

In '54, a final attempt was made to raise the body of Loubens from the burial cairn where it lay for two years. The remains were perfectly preserved in the temperature of 39° F, and were raised in an aluminium canister in an exceedingly difficult and dangerous task, requiring a speleologist to accompany the casket over the last portion of the shaft to free it from obstacles.

The final part of Casteret's book repeats the oft-told tales of his early discoveries and work. Again, as in Ten Years under the Earth, My Caves, Cave-Men New and Old, and Darkness under the Earth, one reads of Montespan, of la Cigalère, of the source of the Garonne, of early bat-banding, and so on. One tends to feel that, if these are repeated any more, they will

take the semblance of recurrent reminiscences of senility. One feature of difference is that a new translator has worked on this last book. Whether it is due to this person I do not know, but the rather annoying melodramatic phraseology rampant in earlier books is now not apparent, and the book is the better for it. Casteret is an intriguing person, and would have represented by himself an adequate subject for a whole set of Enigma Variations. He wavers between an advocacy of caution and the wildest of caving, between a cynical satiety and a refreshing eagerness for discovery, and between an extreme egotism and a rigid insistence that all should have a fair chance to share the great exploration.

As a record of an outstanding speleological venture, Casteret's book is superior to that by Tazieff, although the photographs are generally not up to the same standard. Considered as stories of great human undertakings, I can only advise that you read both, and make your own choice.

Brian J. O'Brien

Meditation on First Being an Oolite.

Come pay your money and see our features,
You inside-out enormous creatures;
Come pay your pennies and stare at will,
At our decay -- come gaze your fill.
Our time for living's ages o'er, when we defied the ocean's roar.
His rollers fell in foaming futile fury,
Reef-broken, bowed beneath our mastery.

Till the first artist, like all of his band
A slothful braggard churl,
While gaping to gabble, swallowed some sand,
Enlarged upon this irritation
Till we beheld its consummation,
A perfect lustrous pearl.

We gazed upon his Art, and sighed,
Gave up building, and in envy died.
But in our technicolour tomb
Lived on. As ghosts we build again,
And for our Art the tomb's a womb.
We died, but did not die in vain.

Envoi:

Prince, the simple perfection and classic profundity
We have brought to our epic lay,
Are mirrored in our sublime rotundity,
As we nestle, below the day.

Chris Wallace & Brian O'Brien.

SPELEOLOGY ABROAD.

The wide extent of speleology throughout the world was made evident in a recent publication by *Rassegna Speleologica Italiana* (June, '55) which listed all societies known to that group at the time. Altogether 29 countries were represented, with Great Britain, France and the United States each containing more than 40 separate societies.

The New Zealand Speleological Society has sent to SUSS four recent issues of its 'quarterly more or less' bulletin. These have shown that the Society, formed in 1949, is very active both in speleology and what may be termed "public relations." One article of particular interest in Bulletin No. 11 is a fine analysis of the "Psychology of Cave Exploring."

Further speleological work on an international basis is being carried out by Lieut. Trevor Shaw of the Cave Research Group of Great Britain. He is compiling a bibliography of cave exploration throughout the British Commonwealth, which is quite a massive task. Several hundred Australian references have been sent to him from SUSS, and in return Lieut. Shaw has forwarded many more which were previously unknown to us. These include a number in the books and journals of the French speleologists.

Recent interest in "foul air" in caves has been displayed in several publications of the National Speleological Society of America. The comparative rarity of high (5%) concentrations of carbon dioxide in caves makes one realise that we are fortunate in having Bungonia Caves so handy for study of foul air (in Australia, strangely, a cave system 130 miles distant is still considered "handy.") A preprint of an article from the forthcoming N.S.S. Bulletin was kindly sent to the Editor by Brother Nicholas of N.S.S. and this reveals that the findings on bad air in American caves are in agreement with results obtained here. Brother Nicholas has also mentioned that N.S.S. has mapped 34 miles of passages and bypassed about twice as much in a cave in Kentucky which is claimed to be the largest in the world. (The other American giants, the Mammoth Cave and the Carlsbad Caverns, have not been fully surveyed.)

In contrast, from France has come a report of the descent to a world record depth of 3,050 feet by a party under Pierre Petzl in a cave near Grenoble.

Correspondence and contributions to be addressed to :

The Editor

c/o The Sydney University Speleological Society

Box 35, The Union

University of Sydney