

JUNE 1974

Vol. 14 No. 3

SYDNEY UNIVERSITY SPELEOLOGICAL SOCIETY
OF THE UNION, SYDNEY UNIVERSITY 2006 Page 21

BULLETIN OF THE SYDNEY UNIVERSITY SPELEOLOGICAL SOCIETY

*Lumen
in
Tenebris*

SUSS



FOUNDED 1948

Box 35, The Union,
University of Sydney,
N.S.W. 2006.

Registered in Australia for transmission
by post as a periodical—Category B.



Price .. £2.50 per year
20¢ each.

LIST OF FUTURE TRIPS

JUNE SOMETIME JENOLAN Jim Seabrook Arrange at meeting.
Wyburds Lake Cave.

JULY 4 GENERAL MEETING 7.30pm in Badham Room (we hope), Sydney Uni
Old Union Building.

JULY 13-14 BUNGONIA (or JENOLAN) Rik Tunney Arrange by letter.

AUGUST? SOMETIME BARBARA DEW MEMORIAL LECTURE
SUSS ANNUAL DINNER

AUGUST SOMETIME JENOLAN Rik Tunney Arrange at meeting.
General work in Mammoth and Wyburds.

NEW YEAR PERIOD Tenth Biennial Convention of Australian Speleological Federation
in Brisbane and field trips.

EDITORIAL

Firstly, the continual moan of the editor - Where are all the trip reports? Many trips have been run this year for which I have received no report. Not only is this slack but it lowers the standard of the newsletter by forcing me to fill up space with rubbish. Unless these naughty people atone for their sins and send in their reports I may be forced to name names.

Elsewhere in this issue you will find two articles on what man is doing to caves. One details (on page 23) what happens when a few fools, who don't know what they are doing, enter a cave and, disregarding safety precautions, get themselves killed. At first this will seem to be irrelevant to NSW, but what if it began to happen at, say, Bungonia. With our present Governments disinterest in the environment would they come along with some APCM(A) cement and close off the cave? What could our Society do to prevent this?

The second article concerns DDT in bats and raises the question as to whether this high concentration is true for the whole animal kingdom (as I believe it is) and when the widespread use of poisonous substances is to be stopped.

You will see a remarkable scarcity of trips in the list above. I am sure that there are more trips on, but the trip leaders have not told me. Then they complain that no one goes on their trips. Members complain that they never know what trips are on. Any information trip leaders send me will be published. Deadline for articles is the Monday of the week before the meeting as that is when I print the bulk of the newsletter. Deadline for trips and articles of great significance is the Monday of the meeting week. So get those dates in.

-Rik Tunney
Editor

SUSS Editorial address - P.O. Box 176 FAIRY MEADOW 2519

"THREE EXPEDITION INTO THE INTERIOR OF EASTERN AUSTRALIA"

Major T.L.Mitchell

(2nd ed. Ch 14 p 319-20) Volume II

OCT. 31 - The Shoalhaven river flows in a ravine about 1500 feet below the common level of the country, between it and the Wollondilly. Precipices, consisting at one part of granite, and at another, of limestone, give a peculiar grandeur to the scenery of the Shoalhaven river. The limestone is of a dark grey colour, and contains very imperfect fragments of shells. We find among the features on these lofty river banks, many remarkable hollows, not unaptly termed "hoppers" by the country people, from the water sinking into them, as grains subside in the hopper of a mill. As each of these hollows terminates in a crevice leading to a cavern in the limestone below, I descended into one in 1828, and penetrated without difficulty, to a considerable depth, over slimy rocks, but was forced to return, because our candles were nearly exhausted. A current of air met us as we descended, and it might have come from some crevice possibly near the bed of the river. That water sometimes flowed into these caverns was evident, from pieces of decayed trees, which had been carried downwards by it, to a considerable depth. I looked in vain there for fossil bones, but I found projecting from the side of the cavern, at the lowest part I reached, a very perfect specimen of coral of the genus favosites....

(This is Bungonia. ..Ed.)

...In a hasty ride which I took as far as Carwary, in 1832, I was conducted by my friend, Mr. Ryrie, to a remarkable cavern under white marble - where I found trap; a vein of ironstone, of a fused appearance; a quartzose ferruginous conglomerate; a calcareous tuff containing fragments of these rocks; and specular iron ore in abundance, near the same spot.

But still further southward, and on the range separating the country at the head of the Shoalhaven river, from the ravines on the coast, I was shown an "antre vast", which, for aught I know, may involve in its recesses, more of the wild and wonderful, than any of the "deserts idle" which I have since explored. A part of the surface of that elevated country had subsided, carrying trees along with it, to the depth of about 400 yards, and left a yawning opening about 300 yards wide, resembling a gigantic quarry, at the bottom of which the sunken trees continued to grow. In the eastern side of the bottom of this subsidence, a large opening extended under the rock, and seemed to lead to a subterraneous cavity of great dimensions.

(This is Big Hole. ..Ed.)

HOLE WHERE DIVERS DIED TO BE SEALED

"The Australian" 29APR74 P3.

A sinkhole where three young Adelaide divers drowned in 1972 will be sealed immediately by the South Australian Government.

The Acting State Premier, Mr Corcoran, announced the decision on the hole known as S86, 30km north-west of Mt. Gambier, after receiving a report on sinkholes prepared by a committee established to investigate the deaths of four Sydney divers in another hole, the Staff on south-eastern South Australia last year.

CONTINUED PAGE 29

Trip Report - CLIEFDEN

25DEC73 - 09JAN74

Present - K.Oliver T/L (HCG, UNSWSS) J.Leonard, S.Wheatley, P.Woodbury G.Pattison, H.Wallis, G.Ferguson, I.Wood, D.Sparks, P.Sparks, G.Hurst (UNSWSS) J.Minney, J.Drurey (OSS) B.Downes (VQ).

On arrival at the property on Christmas Day, the kets were picked up from Bruce Dunhill, and the house cleaned up for the arrival of the multitudes. With this done, a schedule was drawn up for the work to be carried out during the next fortnight.

With the arrival of John Leonard and Bruce Downes, and later, Steve Wheatley and Paul Woodbury, we returned to Mandurama to take on supplies for the next few days. Upon our return to the house we kitted up and set out for the Island outcrop to resurvey Cl55 to CRG 6. The survey only went as far as the squeeze at the end of the passage, as this connects to Island Cave (Cl.6). Some time was spent up in the fissures of the roof, but these did not seem to go.

27th DEC During the morning, we sent off and entered Murder (Cl.2) to push all possible leads, and to familiarise ourselves with the cave with the aim of surveying it in the near future. On reaching the end of the cave, the left hand branch was systematically explored, but nothing new noted. Following a swim in the river, we returned to the house late in the afternoon.

28th DEC After an early start, the five of us set out in the hope of locating Cl 14, Cl 18, and Kellys Cave (Cl27), along Gleasons Ck beyond Yarrawingah (Cl 13). After four hours wrogging the outcrop in question, we had still to locate Cl 14, 18 & 27, so we decided to back-track and locate the upper entrance of Yarrawingah. This was found with a minimum of searching, and tagged Cl 39. A surface survey of both entrances was put down using the forrestry compass and ~~XXXXXX~~ tripod, which had been taken along to survey Cl 14, 18 & 27. That evening we were joined by Graeme Pattison, Helen Wallis, Ian Wood, Graeme Ferguson, & the Sparks family.

29th DEC A party consisting of Sparks, Woodbury, Wheatly, Leonard, Downes & Oliver moved across to Gable (Cl 7) to finish the survey of the cave. While surveying one of the main passages we were joined by Wallis, Pattison and Ferguson who proceeded to push around some of the small holes. Helen forced her way through the voice connection at the end of the cave. (Bet we are the only society with a person the size of a voice.) After eight hours of solis surveying carried out, we packed up the equipment and headed back to base, leaving only about 5% of the cave yet to be surveyed. Following tea, Wood and Ferguson went down to Transmission (Cl 8) to band bats, catching one Horseshoe bat.

30th DEC Wheatley, Leonard & the Hursts commenced grade 6 survey of Yarrawingah (Cl 13). Some six hours were spent in the cave, with the top section and the main chamber being surveyed. On returning to the utility, (parked near the old OSS campsite), it was necessary to use chains to get back to the silo. Meanwhile, Pattison, Ferguson & Wallis had gone across to Buramburungal, to carry out some digging. During their stint in the cave, a further 5 metres of cave was dug, yielding a small chamber.

31st DEC Another 4½ hours were spent in Yarrawingah (Cl 13/39), leaving Portcullis to lower entrance yet to be done. The theodolite was taken over to the Nibicon outcrop to commence the traverse to

CONTINUED PAGE 25.

CONTINUED FROM PAGE 24

tie in all entrances, but problems with the instrument called this to be called off. Ferguson, Pattison & Wallis over to Island for exploration, and connection of all entrances.

1st JAN Oliver led a trip into Main Cliefden (Cl 1) to look for possible extensions between station 70 and the new extension, but nothing new was located. On the way into the cave, a tiger snake was met in the low section going into Clown Room. The snake was quickly dispatched, and after looking around to see if there were any more snakes, the party moved further into the cave. The cave was left via the upper entrance, and remembering the earlier scare on the way in, our exit was made very slowly.

2nd JAN A slide night had been arranged with members of OSS for Thursday 3rd Jan, but not having a radio or calendar with us, we mistakenly arrived a day early. Unfortunately arrangements could not be changed, so we took on more supplies, looked at the attractions in town for some time, then returned to Cliefden.

3rd JAN Early in the afternoon we again set out for Orange, but first of all we passed through town and headed for Borenore. Due to the lateness of the hour, and lack of equipment, only about 1 hour was spent there. After taking a few photos we then returned to Orange. After seeing slides and hearing a little about the history of the area, we once again returned to Cliefden.

4th JAN The theodolite traverse of the Nibicon outcrop was finally started, pin-pointing Cl 42/44 (Buramburungal), Cl 43 (Nibicon), Cl 45, 46 & 41. Returning to the house, the map was drawn up at 1:200.

5th JAN Yarrovigah (Cl 13/39) survey completed by the Hursts and Wheatley. Joe Minney, John Drurey, Bruce Downes and myself again entered Murder (Cl 2) to push any possible leads around the Blue Stalactite area. One promising hole was looked at but could not be entered as it was too tight for any of us, and if forced, would have meant dropping down approx. 4½m. In another section, an aven was looked at, but this would necessitate the use of a scaling pole. Another section leading up into the roof in the vicinity of SSS's RDF4 station was pushed, but after going up for roughly 10-12m this choked off. On the way down from this section, one of the party dislodged a large rock, which narrowly missed two of us who didn't have time to dive for cover. On our way out of the cave, a bone deposit was noticed, and some of these bones were removed and sent away for identification.

6th JAN Wheatley, Ferguson & Drurey set off for Boonderoo to once again try to make a connection with Murder. But once again no go. Minney, Woodbury, Bownes & Oliver obtain cement, shovels, construction mesh, buckets etc., loaded up the tractor and headed over toward Main Cliefden lower entrance to repair the breakage next to the gate. Firstly, three pieces of iron were placed in a criss-cross fashion into the actual hole and wired together. A small sheet of corrugated iron was shaped and placed over the iron rods, then a sheet of 6 gauge construction mesh measuring 4' x 10' laid down and rocks placed on top, which in turn was capped by 3 mixtures of cement. Another three or four mixes will see the job completed.

CONTINUED PAGE 26

CONTINUED FROM PAGE 25

7th JAN no active work was done on this day, as most of the time was spent drawing up the maps and writing the reports.

8th JAN A party was taken into Main Cliefden to investigate a small maze on the left hand side of the Boot Room. A very low broad section was entered but no exits were noted. Average height of this section was approximately 0.8m. On the way out of the lower entrance, it was noticed that the roof just inside the entrance is becoming more and more unstable, and this will have to be looked at more carefully in future. On the return trip to the house, three small holes were looked at but none of these are very promising.

9th JAN Those of us that were left, commenced packing up and by 11.30am had left the area to head South to Wee Jasper then on to Yarrangebilly.

Many thanks must go to those who came to Cliefden during this trip, for without these people the work just could not have been carried out. And also to Dave Sparks and Steve Wheatley who copped unwanted bonuses for their efforts.

Keith Oliver

+++++

Trip Report - CLIEFDEN 16 - 17MAR74

Present - K.Oliver T/L (HCG-UNSWSS), L.Wheatley, P.Woodbury, G.Pattison, H.Wallis, P.Downes, A.Warild (UNSWSS) W.Gamble (CEG(SA)) P.Dykes (StGACT)

After an early start, G.Pattinson led a party consisting of Wallis, Downes and two others over to Gable (CL7) to push for further extensions.

Oliver led the rest over to Boonderoo (CL3) to commence the grade 6 survey of the cave, using the small tripod especially made up for low crawley stuff. While the survey crew commenced mapping, Warild and Dykes pushed everything that they could see. In one small chamber, they pushed down through cracks in the floor. These cracks were very tight, and to continue on, would have meant breaking formation, so these possible extensions were abandoned. Back in the main chamber before the slide, Alan and Peter again pushed everything they saw. At one stage, they had disappeared for some twenty minutes and returned by coming back up the slide.

The slide as we had thought earlier, proved to be the most difficult section to survey, with some $2\frac{1}{2}$ - 3 hours being taken up in this low, slippery, damp, rotten section. Two stations were established in the large chamber at the base of the Slide and we then called it a day. In all, we spent $8\frac{1}{2}$ hours in the cave, and surveyed a total of 208m (=682.43').

On returning to the house, Graeme informed us, that his party had found a further 18.28m of passage with very good formation. This new section will be mapped at a later date.

The following day, we were joined by Joe Minney and a large party from Orange, who were going to do some surface trogging in the Limestone Ck area. Possible extensions were reported in

CONTINUED PAGE 29

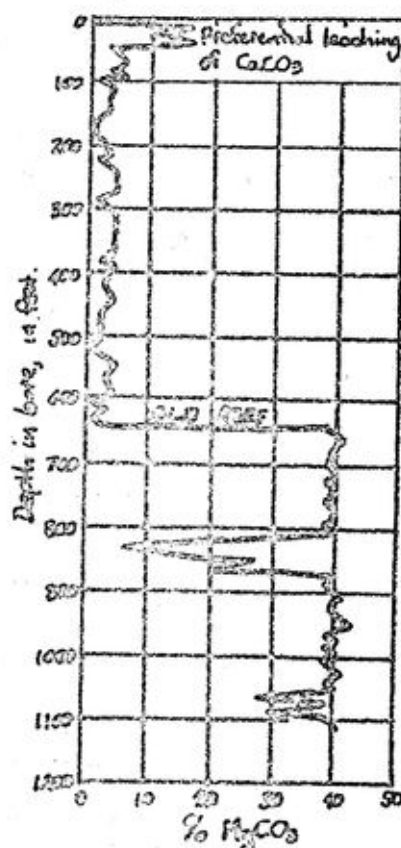
"INTRODUCTION TO GEOLOGY" Read and Watson.

CONTINUED FROM SUSS N1 14(2):20 (May 1974)

As already noted, the calcite of limestones may be mixed with varying amounts of other components, mostly of detrital origin, and thus provide types intermediate to other rocks. These transitional varieties receive appropriate names such as SANDY, CLAYEY or ARGILLACEOUS, BITUMINOUS, PHOSPHATIC or FERRUGINOUS limestones. STINKSTONE or FETID LIMESTONE has a small content of sulphuretted hydrogen which becomes obvious when the rock is hammered.

DOLOMITE, as already noted, is rarely a primary deposit and all important developments of the rock are the result of replacement of calcite limestones by the double carbonate, dolomite, $\text{CaCO}_3 \cdot \text{MgCO}_3$. This replacement is performed by the reaction of the magnesium salts contained in sea-water with the calcium carbonate. By it, the primary structures and textures of the limestone are more or less obliterated, fossil shells are destroyed and large scale crystallisation of dolomite mineral, often in rhomb-forms, takes place. Many reef-limestones have been dolomitised and, since a reduction in volume of over 12 per cent takes place during the process, such dolomite reefs become still more suitable as potential reservoirs of oil.

Fig 163. The Forchuli Bore



A classic example of the replacement of calcite by dolomite is provided

CONTINUED PAGE 28

"THREE EXPEDITIONS INTO THE INTERIOR OF EASTERN AUSTRALIA"

Major T.L.Mitchell

(2nd ed Ch 10 p 228) Volume II

AUG. 20 -On re-entering the river from the sea, I presented the men with a bottle of whiskey, with which it was formally named the Glenelg, after the present Secretary of State for the Colonies, according to my previous intention.

AUG. 21 - We camped in a rather remarkable hollow on the right bank, at the extreme western bend of the river. There was no modern indication, that water either lodged in or ran through that ravine, although the channel resembled in width the bed of some considerable tributary; the rock presenting a section of cliffs on each side, and the bottom being broad, but consisting of black earth only, in which grew trees of eucalyptus. I found, on following it some way up, that it led to a low tract of country, which I regretted much I could not then examine further. I found shells imbedded in limestone, varying considerably in its hardness, being sometimes very friable, and the surface, in places, presenting innumerable fragments of corallines, with pectens, spatangi, echini, ostrea, and foraminifera. In the opposite bank of the river, I found several thin strata of compact chert, containing possibly fragments of corallines, not only on the surface, but imbedded in the limestone. In pulling up the river this morning, we observed a cavern or opening in the side of the limestone rock, and having ascended to it by means of a rope, we entered with lights. It proved to be only a large fissure, and after penetrating about 150 yards under ground, we met with red earth, apparently fallen from the surface. We found, at the mouth of the fissure, some fine specimens of shells, coral, and other marine productions, embedded in several thin strata of a coarser structure, under one of very compact limestone, upwards of 20 feet thick.

AUG. 22 - ...a ford had been cleared across a stream from the north-east, which I named the Crawford;.....The rock about this position consisted of limestone, apparently similar to that seen on its banks further up (See Aug 15). It possessed a stalactitic aspect, by the infiltration of calcareous matter, and in crevices below, I found a reddish stalagmite containing graining of sand....

AUG. 15 - (There is no mention of limestone. ..Ed.)

AUG. 14 - ...Limestone rock appeared on the bank opposite, and at the bottom of some cliffs we found fossil oyster shells....

CONTINUED FROM PAGE 27

by the cores obtained in the deep boring on the atoll of Funafuti and investigated by Judd. The variation in the amount of magnesium carbonate with depth in the bore is shown in Fig.163. The enrichment in magnesium carbonate near the surface can be attributed to the leaching out of calcium carbonate; the sudden change at a depth of nearly 700 feet to almost pure dolomite may indicate that the upper coral rock is built on an older dolomitised reef.

Dolomite is massive granular sacchroidal rock, whitish when pure but more often coloured yellow, buff or brown by iron carbonate - Ankerite is a transitional form between dolomite and siderite, FeCO_3 . MAGNESIAN LIMESTONE contains up to 10 per cent dolomite molecule which is held in solid solution in the calcite.

CONTINUED FROM PAGE 26

Wyreeba (CL9) Graeme Pattison located a hole with a strong draught coming from it, but more work is required here. Oliver led a party over to the Boonderoo-Murder area to put in the surface traverse taking in Boonderoo (CL3), Murder (CL2), the daylight hole over Childrens (CL12) and the CL24 doline.

The area was vacated by 4.30pm.

-K.Oliver.

+++++

CONTINUED FROM PAGE 23

The Shaft is to remain open under closer supervision than previously. Divers are now strongly advised to dive there only if wearing a safety line.

The committee said if voluntary co-ordination of education and control of diving by a permanent advisory ~~xx~~ committee failed, legislation to licence instructors, issue diving permits and provide patrol officers would be necessary.

+++++

Trip Report - CLIEFDEN 2 - 3FEB74

Present - K.Oliver T/L (HCG-UNSWSS) J.Minney, J.Drurey and J.Gordon (OSS)

As this was the first trip into the area since the Xmas trip, most of our usual crowd were either out of town or were still recovering from the various trips that took place over the Xmas period, it was decided to make this a reasonably leisurely trip.

With the arrival of OSS on the Saturday morning, the group set off to survey CL16 which is situated in the cliff face east of the Island outcrop.

As the survey was commenced, three of the party moved off to attempt to force the squeezes at the ends of the main passage and the upper passage, and most of us had an attempt at the squeeze on the southern wall. Finally after 2 hours and much cursing the survey was completed to GRG6. It will seem highly unlikely that the squeezes will be pushed unless the mythical bean-pole man offers his services.

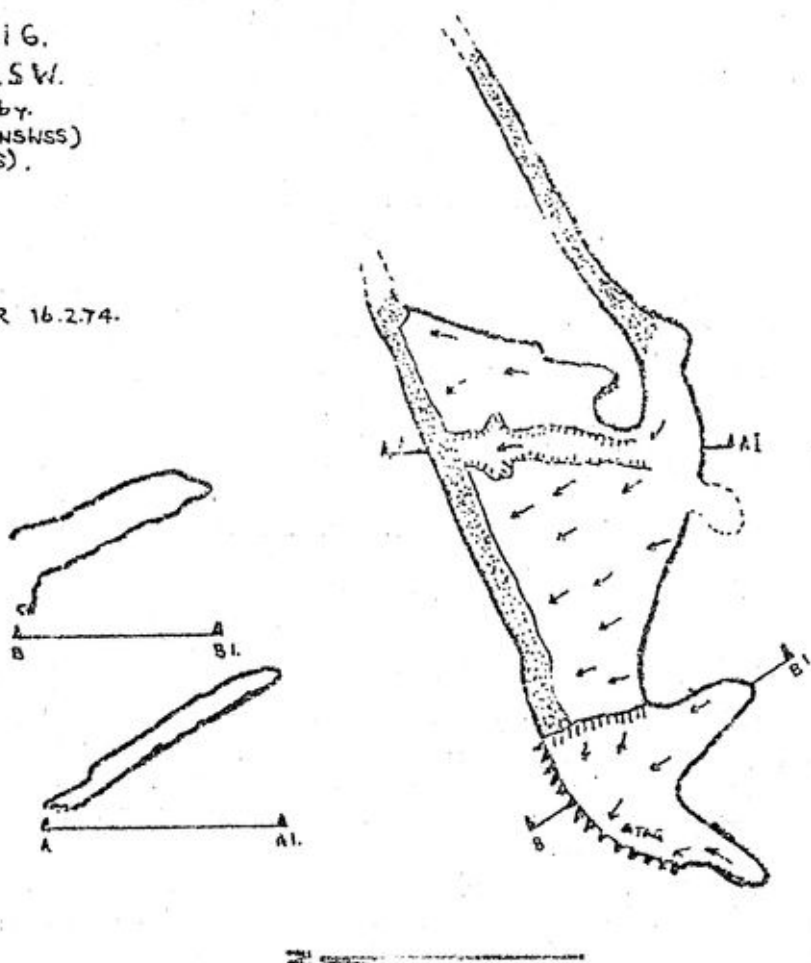
On our return to the car, we drove down to the river then walked up Davys Ck to the rim stone pools. Some time was spent here postulating the formation of these "wāerdes".

The Sunday saw us upstream of the Gable outcrop for a preliminary look around for the theodolite survey which should be commenced by Easter '74. Most cave entrances were pointed out and two numbers attached, CL48 and CL49. They are not caves, but remnants of old caves that have collapsed. They are located

CONTINUED PAGE 30

CONTINUED FROM PAGE 29

SURVEY of CLIG.
 CLIFDEN N.S.W.
 SURVEYED 2.2.74. by.
 K. OLIVER. (HCA-UNSWSS)
 G. FERGUSON. (UNSWSS).
 J. MINNEY. (OSS)
 J. BRUREY. (OSS)
 J. GORDON. (OSS)
 CRG 6.
 SCALE 1:200.
 DRAWN by K. OLIVER 16.2.74.



approximately halfway up the outcrop, on a bench that slopes at about 35 degrees, and are about 45m upstream of Gable (CL7).

Before leaving the area Bruce Dunhill gave me the approx. position of four other small caves. The area was vacated by 8.15pm.

-K.Oliver.

+++++

Change of address:

A.W.Watt
 Res. ad: 155 Australia St
 CAMPERDOWN
 Postal ad: Box 385 Wentworth Building
 SYDNEY UNIVERSITY 2006

OUT OF THE PAST

- SUSS Journal Volume 1 Number 2 July 1952.

There were eleven cave reports in this issue. Details of Pālonā Cave, National Park included an analysis of a stalactite and a discussion of the area (1). Brief notes were given on Moore Creek (2).

Croesus Cave at Mole Creek was visited in 1949, two of the entrances being found (3). A party walked into Bendethera Caves from Khan Yunis. Bendethera Cave and a few holes were found (4). A general description of Tuglow included a discussion of the hydrology of the area. A frog, a bat and a long horned grasshopper were identified by the Australian Museum (5).

An article on Borenore (Boree) contains detailed descriptions of the locations of the four main cave systems of the area. Erosion from farms on the slopes of Mt Canoblas has caused much siltation (6).

A trip to Jenolan in 1950 found the heights of some caves relative to Blue Lake. A cave near Playing Fields was discovered (Henrys Hole?..Ed.) Details of the location and interior of Frenchmans Cave were given. The ladder hanging down the cliff was there even then. The area upstream from Bottomless Pit was investigated. Some holes, an efflux and a sink were found (7). A party entered Bottomless Pit with the aid of a 200' ladder (8).

Trips were made to Yarrangobilly in 1950-1. The Eagles Nest system was named. An efflux upstream of Natural Bridge was entered. It was thought to be Deep Creek. Exploration was made in Coppermine Cave and two entrances are mentioned. A new entrance to South Glory and a connection from South Glory to Dantes Inferno in North Glory were found. A later trip entered West and East Eagles Nest Caves for a short distance. Lack of footprints and local opinion indicates this was the first party to enter the cave. Both East and West Deep Creek Caves were entered. A sink hole on the hill near Natural Bridge was found (9).

Jenolan was visited to investigate the possibility of making a documentary movie. The party entered Elder Cave and generally explored Imperial and Jubilee Caves (10).

A detailed article discussed cave photography. Detailed directions and equations were given on the use of magnesium ribbon and powder (11).

Detailed records of weather at Jenolan both in and outside the caves are given and extensive conclusions, together with suggested future work, are made (12).

-Reviewed by R.Tunney.

Bibliography-

1. Friend, N. "The National Park - Sydney" SUSSJ 1(2);3
2. Jeffries, F. "Moore Creek Caves" SUSSJ 1(2);3-4
3. Cohen, L. "Liena Caves - Tasmania" SUSSJ 1(2);4-5
4. Kelly, J. "Bendithra Caves" (sic) SUSSJ 1(2);5
5. Kelly, J. "Tuglow Caves" SUSSJ 1(2);6-7
6. Kelly, J. "Borenore Caves" SUSSJ 1(2);7-8
7. Fairlie-Cunninghame, H. "Jenolan Caves" SUSSJ 1(2);8-9
8. Kelly, J. "The Bottomless Pit" SUSSJ 1(2);9
9. MacGregor, P. "Yarrangobilly" SUSSJ 1(2);10-13
10. Slater, E. "Jenolan" SUSSJ 1(2);14-15
11. Fairlie-Cunninghame, H. "Cave Photography" SUSSJ 1(2);17-22
12. MacGregor, P. "Physical Characteristics of the Air in and Around Jenolan Caves" SUSSJ 1(2);23-30

DDT IN THE BENT-WINGED BAT IN AUSTRALIA

-J.D.Dunsmore (2), L.S.Hall (2), and K.H.Kottek (+).

Reprinted from SEARCH Vol.5 No.3, March 1974.

It is apparent from the Australian Academy of Science report, "The Use of DDT in Australia" (1972), that there is little data from which to judge the extent to which non-target species have accumulated DDT in their tissues. The described study was a small attempt to collect some of this data for one species, an insectivorous bat.

MINIOPTERUS SCHREIBERSII is a small insectivorous bat found from northern Western Australia and Northern Territory, through coastal Queensland, New South Wales and Victoria, to south-eastern South Australia (Ride, 1971). It is the most common cave bat in eastern Australia, and large numbers have been banded (Purchase, 1969).

Information from banding M.SCHREIBERSII in south-eastern New South Wales indicates that from November onwards females congregate at Church Cave, Wee Jasper (47km WNW of Canberra), where parturition occurs in mid-December. By late March most of the bats have dispersed in a coastal direction to form colonies with adult males in caves and mines in the ranges south of Braidwood (about 66km ESE of Canberra). Dispersal routes are generally direct and female and juvenile bats from Wee Jasper colony are known to pass through Canberra on the way to their wintering areas.

It is unlikely that bats of this colony, at either Wee Jasper or in the wintering areas, would feed near areas where intensive crop spraying is carried out. A possible exception is from the horticultural use of insecticides in Canberra.

During a period of 18 months seven samples of varying numbers of bats were collected (totalling 116 individuals). The bats were killed within a few hours of collection and frozen until whole-body analyses for DDT and its metabolites were carried out. Additional bats were collected at the time of one sample and maintained on a diet of mealworms. These were then used in an experiment to determine the amount of DDT that accumulated in the tissues of bats fed DDT until half of the group either died or showed clinical signs of toxicity.

The bats were frozen (-20degC) immediately after being killed and kept frozen until ready for the analysis. The entire carcass was weighed, sliced, homogenised and the fat extracted with dichloromethane and acetone. Pesticides were extracted in a column packed with florisil. The pesticides were identified by thin-layer chromatography over aluminium oxide-coated plates; amounts were determined by gas-liquid chromatography.

All results have been expressed as total DDs (DDT+DDD+DEE) per whole bat. The bats showed a very marked variation (apparently seasonal) in the amount of fat in their bodies. This means that the body weight of each bat largely depends on its degree of fatness. The results show that the adults

@ Division of Wildlife Research, CSIRO, P.O.Box84, Lyneham, A.C.T. 2602

+ Department of Science, Australian Government Analytical Laboratory,
Melbourne, Vic.

CONTINUED NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

had a fairly constant amount of DDs in their bodies. Calculations show that much apparent between-sample variation would be present in the result in the results if they were expressed as DDs per unit of either body weight or fat. Jefferies (1972) made similar observations in his studies of DDs in bats in England.

The treated bats were fed about 15ug of DDT daily. The DDT was dissolved in corn oil and injected into the bodies of mealworms. (It was not possible to follow the protocol accurately and we believe the bats received less DDT than intended.) The control bats were fed mealworms into which unadulterated corn oil had been injected. The treated bats either died of DDT poisoning, were killed showing signs of severe toxicity, or showed no signs of poisoning and were sacrificed after 20 days of treatment. The bats that died, and those regarded as showing signs of severe toxicity, all exhibited the severe muscular tremors that are a feature of poisoning by chlorinated hydrocarbons. These three groups of bats had similar amounts of DDs in their tissues and have not been separated in the results (Table 1).

TABLE 1

	n	Mean+ Body Weight	Mean % + Fat	Total+ DDs (ug)
Treated Group	8	13.5 \pm 2.0	8.4 \pm 3.4	660 \pm 262
Control Group	9	13.9 \pm 1.2	9.4 \pm 3.8	40.2 \pm 16.6

+ Mean \pm standard deviation.

The bats that received DDT had clearly accumulated quite large amounts in their tissues. The control bats in the experiment also had considerably more DDs in their tissues than did the bats in the third survey sample, of which the experimentals were a subsample. Presumably they ingested extra DDT following their contamination with corn oil containing DDT from the fur of the treated bats. Possibly the corn oil contained a significant amount of DDT.

The five samples of adult bats (88 animals) had a mean of 15.9ug DDs in their bodies; in contrast, the two samples of juvenile bats (28 animals) showed only 8.8ug DDs per bat. Presumably this difference reflects duration of ingestion of DDT and it is interesting that the juveniles (only 2-4 months old) had already accumulated so much. We are unable to further classify the adults by age so cannot tell whether the oldest bats had most DDs or whether an equilibrium point was reached.

MINIOPTERUS SCHREIBERSII is quite a long-lived animal (in the last 5 years the Australian Bat-banding Scheme has found 25 examples of banded individuals living more than 10 years (D. Purchase, pers. comm.)). Hence it is probable that the species is adapted to a low rate of adult mortality and any factor potentially capable of increasing the adult death rate is very important. Despite the much larger mean amounts of DDT and its metabolites in the treated group of bats than in the wild-sampled ones

CONTINUED NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

there is evidence that the bats in this area could be in some danger if their rate of ingestion of DDT increased. One of the DDT-treated bats was sacrificed when near death (the bat could not fly or crawl and showed severe continual tremors) and contained 255ug DDs. The minimum amount that can be accumulated and tolerated in the tissues is clearly less than this, and in wild conditions may be considerably less. One of the wild bats sampled contained 56ug of DDs. This suggests that there may well be some wild bats containing something approaching a minimum lethal dose of DDs.

TABLE 2

Date	Site	n	Main" Age Class	Mean@ Body Weight	Mean@ % Fat	Total DDs (ug)
1971-04-04	Wee Jasper	15	A	12.8 \pm 0.6	5.6 \pm 1.5.	14.5 \pm 3.2
1971-05-17	Major's Ck	15	A	14.7 \pm 0.9	12.1 \pm 3.2	13.5 \pm 7.0
1971-09-10	Cleatmore and Marble Arch+	20	A	11.1 \pm 0.7	3.4 \pm 2.0	15.7 \pm 9.3
1972-02-11	Wee Jasper	11	J	11.1 \pm 1.1	2.0 \pm 0.6	6.2 \pm 3.2
1972-03-24	Wee Jasper	17	J	12.9 \pm 0.8	5.9 \pm 2.8	10.5 \pm 4.2
1972-06-23	Marble Arch	15	A	19.1 \pm 1.4	28.3 \pm 2.8	15.2 \pm 3.4
1972-07-18	Cleatmore+	23	A	15.6 \pm 1.4	22.4 \pm 5.0	19.0 \pm 13.3

" A=adult; J=juvenile

+ These caves are in the general area of Major's Creek

@ Mean \pm standard deviation

The only comparable study is that of Jefferies (1972) who examined DDT residues in a variety of insectivorous bats in England. The only data for whole-body residues in that paper is a series of 7 bats (of 4 species) which contained an average of 18.6ug DDs. This appears similar to our findings but Jefferies' bats were all of much smaller species (2.3 - 8.6g) so the data are not strictly comparable but suggest that the Australian bats are ingesting less DDT than those in England. Jefferies (1972) also conducted some DDT feeding experiments quite similar to ours. Some of his bats died containing less than 150ug of DDs, but again, they were much smaller species of bats so that our results are in good agreement.

The most comprehensive study of organochlorine insecticides in bats is that of Jefferies (1972) who suggested "that organochlorine insecticides could be a major factor in the reported declines in the bat population of Europe". The evidence from our study does not suggest that the particular bat population studied is at present endangered but we believe levels of DDs are sufficiently high to cause concern. It should also be remembered that this bat population is not in an area where organochlorine insecticides are used intensively.

CONTINUED NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

Acknowledgement

We thank the NSW Parks and Wildlife Service for permission to collect the bats and the Commonwealth Analyst, Dr F.E. Peters, for facilitating the analyses.

References

- AUSTRALIAN ACADEMY OF SCIENCE (1972) "The Use of DDT in Australia" Reports of the Australian Academy of Science No.14
JEPPERIES, D.J. (1972) "Organochlorine Insecticide Residues in British Bats and Their Significance" J.Zool., Lond., 166 245
PURCHASE, D. (1969) Sixth, Seventh and Eighth Annual Reports on Bat-banding in Australia, July 1964 to June 1967. Tech.Pap.Div.Wildl.Res. CSIRO, Aust., No17.
RICE, W.E.L. (1971) A Guide to the Native Mammals of Australia. Oxford University Press.

+++++

TRIP REPORT - CLIEFDEN 2-3MAR74

Present: K.Oliver T/L (HCG, UNSWSS), D.Sparks, J.Leonard, L.Wheatley (UNSWSS) C.Bennett, Peter ? (OSS), A.Adsett (V), W.Gamble (CEGSA)

After picking up the keys from Mr Lunhill, the party moved off to survey Murder (CL2) and Childrens Cave (CL12). Taking the forestry compass, Dave Sparks led a party through Childrens Cave and surveyed the cave to CRG 6.

With the Childrens survey completed, the party then moved into Murder. Approximately 120m of cave was mapped before we returned to the house to clean up, as OSS were celebrating their 21st Anniversary.

The following day, Dave and his party returned to Murder and continued the survey on to the end of the large chamber. In the meantime, Chris Bennett and another OSS member arrived, and with John Leonard and myself, walked from Transmission (CL8) to the Gable outcrop and located Deep Hole (CL15), we then moved over to locate CL20, then Kellys Hole (CL27) and CL17. Deep Hole is situated approx 30m E of Tiddalick (CL29) and is a shaft some 20m deep. According to Chris, about half way down the wall sounds hollow, possibly connects to Tiddalick.

CL20 is situated approx 200m W of the Transmission lines on the N side of the river on top of the outcrop but near the cliff edge, with about 50m of passage. Kellys Cave (CL27) is situated approx 1½ miles up Gleasons Ck, and is roughly 10m above creek level. 40-60m of passage. CL17 is situated in the W side of Gleasons Ck 45-50m above the flat. The entrance is along a fissure but cannot be penetrated unless a large rock in the entrance is blown away. All the caves with the exception of CL17 will have to be mapped.

-K.Oliver.

TRIP REPORT - CLIEFDEN 16-17FEB74

Present- K.Oliver T/L (HCG, UNSWSS) S.Wheatley, P.Woodbury, L.Wheatley, D.Sparks, G.Ferguson, J.Stibbs, J.Carmichael, S.Banks (UNSWSS) W.Gamble (CEGSA) J.Heath (HCG) J.Minney, J.Brurey, J.Gordon (OSS) A.King (V) AND OTHERS WHOSE NAMES I UNNO, SORRY PEOPLE.

On the Saturday morning three parties were put into Main Cliefden. Party No1 led by D.Sparks continued surveying taking in the passage between Clown Room, and the chamber between Boot Room and the mud maze, then finishing the wall detail between Clown Room and Boot Room.

Party No2 led by S.Wheatley investigated all passages surrounding Laurell Room, then all mud passages back into Boot Room. It seems that there is more passage here than was previously thought. Steve didn't like the idea of surveying this section with Suuntos, and has been volunteered to use the forrestry for the job.

Party no3 was led by J.Heath and consisted mostly of visitors. This party was to go through the Jewel Extension and follow any possible leads, but no new leads were observed.

Back on the surface, three small caves were tagged CL53, CL61 and CL62. These caves are located in an outcrop directly behind the house opposite the shearers quarters. Longest being 11m long.

On the Sunday Oliver led a surveying party into Main Cliefden to survey the rifts between Laurell Room and the main passage. Ferguson led a surveying party of 5 down Boonderoo (CL3) for exploration, but nothing new was noted.

All of the party had vacated the area by 3.30pm.

-K.Oliver.

SYDNEY UNIVERSITY SPELEOLOGICAL SOCIETY
BOX 55 THE UNION, SYDNEY UNIVERSITY

ABOUT THE CAVE

Reprinted from "Off Site Venture Camp - Curramulka, South Aust."
Scout Association, 10th Australian Jamboree 1973-4.

The Curramulka Cave is situated about a mile to the SW of the township of Curramulka and is the third longest in Australia. Unfortunately the cave holds little of the wondrous splendor and beauty of formations. The cave does have a hidden treasure in the beauty of its 'honeycomb' mazes and digs. The mazes make the cave dangerous to the inexperienced caver, as the many ways and similarities can bewilder and confuse him. At the same time, the feeling of finding a new way to an already known place can hold its own fascinations, as there are so many different ways of doing this in much of the cave. The smallest and most unlikely ways often lead to further passage-ways and crevasses, and each new trip invariably finds new sections.

Curramulka is in an uncommon limestone area of Cambrian age (600 million years old). The limestone is very hard and water washed channels have been formed along many of the fault lines of the rock. The cave was certainly much larger than it is now, but silting has filled many of the crevasses.

-Anon (But probably P.Tonkin ..Ed)