Vol. 8, No. 3 JULY, 1970 PRICE 60c.

Helictite

JOURNAL OF AUSTRALASIAN CAVE RESEARCH

Crystal pool, Chevalier Cave, Jenolan, N.S.W. Photo : E. A. Lane

"HELICTITE"

Journal of Australasian Cave Research

Edited by Edward A. Lane and Aola M. Richards

VOLUME 8 NUMBER 3 Published Quarterly JULY, 1970

CONTENTS

Price of this issue: To non-subscribers, A$1. Additional copies to subscribers, 75¢. Included in annual subscription, 60¢. Annual subscription, A$2.40, post paid Australia. All foreign subscriptions, A$2.60, post paid. All subscriptions taken on basis of full volume of four issues. Correspondence, contributions and subscriptions to "Helictite", Post Office Box 183, Broadway, New South Wales 2007, Australia. "Helictite" is printed and published by E. A. Lane.

A B S T R A C T S

OBSERVATIONS ON THE BIOLOGY OF PALLIDOTETTIX NULLARBORENSIS RICHARDS (RHAPHIDOPHORIDAE : ORTHOPTERA) FROM THE NULLARBOR PLAIN. By Aola M. Richards. Proc. Linn. Soc. N.S.W., 94 (3), 1970 : 195 - 206.

The complete life cycle of the cave cricket, Pallidotettix nullarborensis Richards, probably takes up to two and a half years: about 11 to 12 months being required for the development of the egg; 11 to 12 months for the nymphal instars; and possibly five to six months for the adult. Females mature in late summer and males in autumn. Oviposition occurs during the winter months. First instar nymphs appear in late autumn, so embryos probably undergo a summer diapause. Seven pre-adult instars are passed through. There is no winter diapause during nymphal instars. Usually only one generation is present in the population. P. nullarborensis is the first species of Macropathinae to exhibit signs of cave adaptation. Although scavengers, P. nullarborensis are primarily carnivorous and arthropods are their main food source. They will feed on both live and dead tissues. Their predation on newly hatched chicks is only the second record of such behaviour by Rhaphidophoridae. Activity rhythms are similar to those of other Australasian cave crickets. - A.M.R.

NEUE PSEUDOSKORPIONE AUS AUSTRALIEN. By Max Beier. Ann. Naturhistor. Mus. Wien, 73, 1969 : 171 - 187.

Thirteen species and subspecies of Australian pseudoscorpions are listed. Among these a new genus is erected and eleven new species are described. Of the new species, five are surface species from Queensland; one is a cave species from Victoria; one is from a Galah nest in South Australia; two are surface species and two cave species from the Nullarbor Plain, Western Australia. Among the cave species, Pseudotyrannochthonius gigas Beier is recorded from Harmon One Cave and Church Cave, Byaduk, Victoria. Cryptocheiridium australicum Beier is recorded from bat guano in Murra-el-elevyn Cave, Nullarbor Plain. The new genus Troglochernes Beier is erected for the new species T. imitans Beier from Dingo Cave, Nullarbor Plain. The widely distributed Australian species Protochelifer cavernarum Beier has new records from Mullamullang Cave, Lynch Cave and Murrawijinie Number 3 Cave, Nullarbor Plain; Gooseberry Cave, Jurien Bay, Western Australia; and Super Cave, Nambung River, Western Australia. The subspecies P. cavernarum aitkeni Beier is known only from Abrakurrie Cave on the Nullarbor Plain. - A.M.R.

A COLLECTION OF THE BAT, CHALINOLOBUS MORIO (GRAY), FROM THE NULLARBOR PLAIN, WESTERN AUSTRALIA

LESLIE S. HALL

CSIRO Division of Wildlife Research, Canberra, A.C.T.

Abstract

A collection of 23 live specimens and 26 complete skeletons of the bat, *Chalinolobus morio* (Gray), was taken from two caves on the Nullarbor Plain. Tables of their forearm and skull measurements are presented.

A comparison of the forearm measurements of Nullarbor specimens of *C. morio* with those of eastern Australian specimens of this species revealed a statistically significant difference ($p<0.01$). In Western Australia, *C. morio* appears to roost and breed in caves, while in eastern Australia, it is generally recognised as a tree dweller.

Records of other species of bats collected on the Nullarbor Plain are given.

Introduction

The presence of bats in caves on the Nullarbor Plain has been known for some time (Barrett, 1930; Thomson, 1952; Kemsley, 1957), but until recently there were no published records of their identity. Hamilton-Smith (1965, 1966a) has recorded *Chalinolobus morio* from Weebubbie (N2), Abrakurrie (N3), Madura (N62) and Murra-el-elevyn (N47) caves (cave numbers from Hill, 1967). It has also been recorded from Warbla (N1), Cocklebiddy (N48), Mullamullang (N37) and Walpet (N38) caves (P. Aitken, pers. comm.).

During May, 1963, twenty live specimens of *C. morio* were collected by the author from Murra-el-elevyn Cave and three others from Weebubbie Cave. Twenty-six complete skeletons of *C. morio* were also taken from the floor of Murra-el-elevyn Cave.

Specimens

Live. Six of the live specimens from Murra-el-elevyn Cave were collected roosting near the entrance (See A, Figure 1) at night. They appeared to be using this area as a resting place while feeding. The roost was in the twilight zone and no bats were present during daylight hours. The other 14 specimens were collected on the wall in the far chamber of Murra-el-elevyn

Cave (See B, Figure 1). The three specimens from Weebubbie Cave were collected from the roof of the cave some 50 metres from the entrance.

Skeletal. Twenty-six complete skeletons were collected from the floor of Murra-el-elevyn Cave (See C, Figure 1). They were dehydrated and some were completely devoid of fur. Sex determinations were impossible. Table 1 shows measurements of the skeletons collected. Skeletal remains of smaller bats also were found in the same locality. The skulls had identical proportions to those of C. morio. Forearm measurements ranged from 23.2 mm to 27.0 mm. The skeletons were extremely fragile and were assumed to be those of juvenile C. morio. This evidence of juvenile C. morio occupying Murra-el-elevyn Cave adds support to Hamilton-Smith's (1965) suggestion that the cave is a maternity cave for C. morio.

Comparison of Forearm Measurements of C. morio from Eastern Australia and the Nullarbor Plain

Ryan (1966) in his analysis of the genus Chalinolobus gives the mean forearm measurement of five specimens from eastern Australia as 38.3 mm. The mean forearm length of 11 specimens of C. morio collected in eastern Australia is 38.39 mm (see Table 2). The mean forearm length of the combined live and skeletal specimens of C. morio from the Nullarbor Plain is 36.70 mm (Tables 1 and 2).

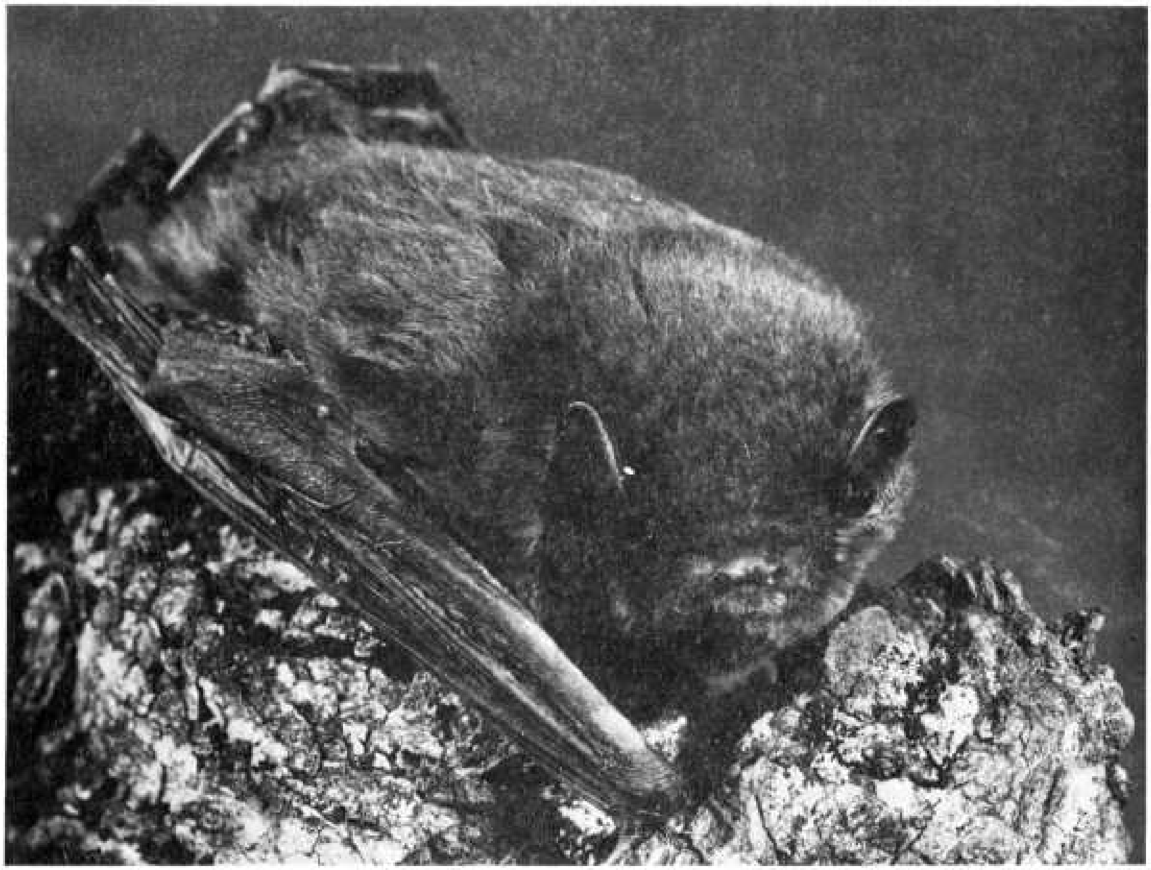
A comparison of the forearm lengths of the combined Nullarbor Plain specimens with the forearm lengths of the eastern Australian specimens (Table 2) reveals a statistically significant difference ($p < 0.01$). The comparison was done using an extended t-test described in Bailey (1959, pp 47 - 48).

Discussion

In some preliminary notes on Western Australian cave fauna, Hamilton-Smith (1965) records C. morio from the caves in the Jurien Bay area and suspects that one, Gooseberry Cave, could be a possible maternity cave for the species.

In eastern Australia (New South Wales and Victoria), C. morio has been collected from the abandoned mud nests of the Fairy Martin, Petrochelidon ariel (Gould), located in culverts, under bridges, and in the entrances of caves (J. McKean and W. Price, pers. comm.). Apart from these records it appears that C. morio is a tree-dwelling species in eastern Australia. Little is known about the maternity sites for C. morio in eastern Australia, but it is suspected that pregnant females form small maternity colonies in tree hollows.

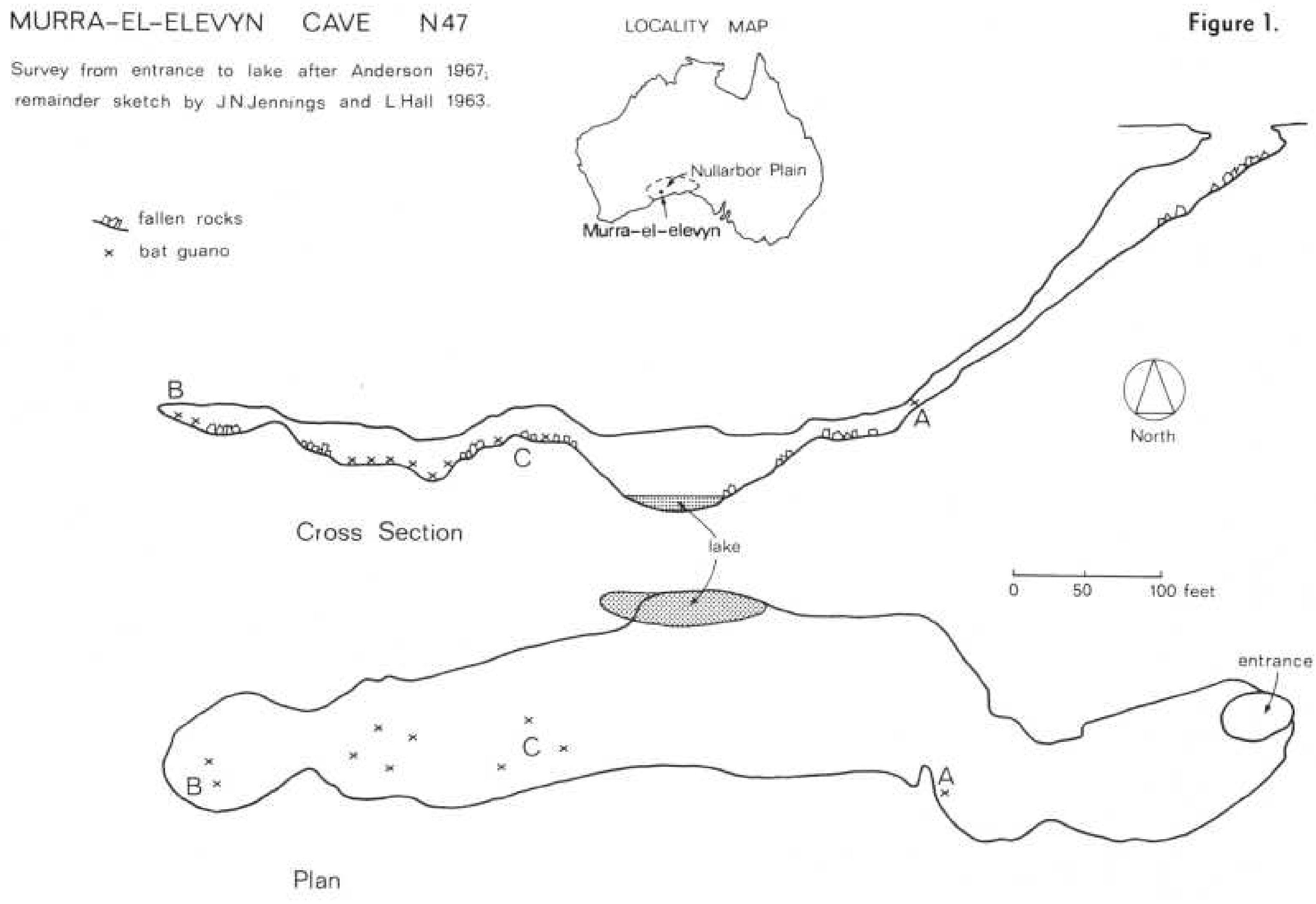
The Nullarbor Plain lacks a suitable tree-roosting habitat for C. morio, offering only a cave-roosting habitat. Caves provide a relatively stable



Front (top picture) and side view (right) of *C. morio*, from Canberra, A.C.T., showing the "simple face" characteristics of a Vespertilionid bat.

Photographs by G. Chapman.

Figure 1.



MURRA-EL-ELEVYN CAVE N47
Survey from entrance to lake after Anderson 1967;
remainder sketch by J.N.Jennings and L.Hall 1963.
LOCALITY MAP
Nullarbor Plain
Murra-el-elevyn
fallen rocks
bat guano
B
C
A
North
Cross Section
lake
0
50
100 feet
entrance
Plan

TABLE 1. MEASUREMENTS (MILLIMETRES) OF 26 *C. MORIO* SKELETONS FROM MURRA-EL-ELEVYN CAVE

REGION	RANGE	MEAN	S.D.	S.E.
Forearm radius	35.10 - 37.80	36.59	0.97	0.19
Skull, greatest length	10.7 - 12.2	11.7	0.38	0.075
Brain case depth	4.9 - 6.6	5.5	0.37	0.072
Brain case breadth	6.6 - 8.0	7.6	0.36	0.069
Interorbital breadth	3.2 - 5.0	4.3	0.44	0.087

TABLE 2. COMPARISON OF FOREARM MEASUREMENTS (MILLIMETRES) OF LIVE *C. MORIO* FROM THE NULLARBOR PLAIN AND EASTERN AUSTRALIA

NULLARBOR				EASTERN AUSTRALIA			
Murra-el-elevyn		Weebubbie		Moriac (Vic.)	Canberra (ACT)	Griffith (NSW)	Albury (NSW)
Male	Female	Male	Female				
37.2	35.8	37.4	-	38.9	39.7	37.8	38.0
36.2	36.3	35.6	-		38.1		38.0
36.7	37.9	36.7	-		39.1		
36.1	38.4				37.8		
36.9	37.1				37.3		
35.5	37.3				39.0		
37.5	37.3				38.6		
	37.6						
	38.2						
	36.7						
	36.7						
	35.0						
	37.0						

ANALYSIS OF THE MEASUREMENTS GIVEN ABOVE

REGION	TOTAL SPECIMENS EXAMINED	RANGE (mm)	MEAN	S.D.	S.E.
Nullarbor	23	35.0 - 38.4	36.80	0.90	0.20
Eastern Australia	11	37.3 - 39.7	38.39	0.75	0.23

environment where temperature and humidity are, in general, regarded as being constant. C. morio has been recorded from eight caves on the Nullarbor Plain and is suspected to breed in Murra-el-elevyn Cave.

It is assumed that bats evaporate a good deal of moisture from their wing membranes when flying. The high protein content of the insect diet of C. morio would necessitate strict water regulation in the bat. It is possible that C. morio roosts in select caves on the Nullarbor Plain to avoid the harshness of the surface environment, and these caves have a moisture content of which C. morio can take advantage to regulate its water metabolism.

Species of Bats Recorded from the Nullarbor Plain

It is interesting that few species of bats have been recorded from the caves of the Nullarbor Plain. Collections of bats from the surface of the Nullarbor Plain also reveal a paucity of species.

Jones (1925) lists Nyctophilus geoffroyi (Leach) and Chalinolobus gouldii (Gray) from the eastern limits of the Nullarbor Plain at Ooldea. He also recorded Taphozous georgianus (Thomas) and Tadarida australis (Gray) from Ooldea. T. georgianus is invariably found in caves or rock shelters, and it is possible that these species of bats could be found in the Nullarbor caves.

Lundelius (1963) recorded the skeleton of Nyctophilus geoffroyi from Murra-el-elevyn Cave. The skeleton was collected under the over-hanging roof of the doline and was contained in the regurgitated pellets of an owl. Occasional specimens of N. geoffroyi have been recorded in Mullamullang Cave (Hamilton-Smith, 1966b) and one specimen was taken from Koonalda Cave (Hamilton-Smith, 1966a).

The CSIRO Division of Wildlife Research Mammal Collection contains specimens of Tadarida australis, Nycticeius balstoni (Thomas) and Chalinolobus gouldii collected in free flight at Karonie, Western Australia. There is also a specimen of Nyctophilus geoffroyi collected in free flight at Seymour Station, 60 miles north of Rawlinna, W.A.

Chalinolobus morio appears to be the dominant cave-dwelling bat of the Nullarbor Plain.

Acknowledgments

I should like to thank J.N. Jennings, of the Australian National University, Canberra, for making it possible to collect the Nullarbor Plain specimens. J.L. McKean and W. Price supplied information for the text and G.S. Chapman took the excellent photographs. J.L. McKean read and criticised the text.

References

ANDERSON, E.A. 1967 : In Caves of the Nullarbor. Ed. J.R. Dunkley and T.M.L. Wigley. Speleological Research Council Ltd., University of Sydney. See p. 6.

BAILEY, N.J.T. 1959 : Statistical Methods in Biology. John Wiley and Sons, New York, 197 pp.

BARRETT, C. 1930 : Wild Nature on the Nullarbor Plain. Aust. Mus. Mag., 30 : 115 - 121.

HAMILTON-SMITH, E. 1965 : Some Preliminary Notes on Western Australian Cave Fauna. Western Caver, 5 (3) : 1 - 5.

HAMILTON-SMITH, E. 1966a : The Geographical Distribution of Australian Cave-dwelling Chiroptera. Int. J. Speleol., 2 : 91 - 103.

HAMILTON-SMITH, E. 1966b : Biological Notes. In Mullamullang Cave Expeditions 1966. Ed. A.L. Hill. Cave Exploration Group (South Australia) Occas. Pap. No. 4 : 33 - 35.

HILL, A.L. 1967 : Ckecklist of Caves and Related Features. In Caves of the Nullarbor. Ed. J.R. Dunkley and T.M.L. Wigley. Speleological Research Council Ltd., University of Sydney : 50 - 61.

JONES, F. WOOD. 1925 : The Mammals of South Australia III. Government Printer, Adelaide.

KEMSLEY, D.S. 1957 : The Mysterious Nullarbor Plain. Walkabout, 24 (11) : 15 - 18.

LUNDELIUS, E.L. 1963 : Vertebrate Remains from the Nullarbor Caves, Western Australia. J. Roy. Soc. W.A., 46 : 75 - 80.

RYAN, R.M. 1966 : A New and Imperfectly Known Australian Chalinolobus and and the Status of African Glauconycteris. J. Mammal., 47 : 86 - 91.

THOMSON, J.M. 1952 : The Nullarbor. Walkabout, 18 (11) : 29 - 34.

****

LAKE LEVEL FLUCTUATIONS IN COCKLEBIDDY CAVE, NULLARBOR PLAIN, WESTERN AUSTRALIA

DAVID C. LOWRY *

Abstract

Changes in air pressure in Cocklebiddy Cave, Nullarbor Plain, Western Australia, cause the lake level to fluctuate by several centimetres. The relationship suggests that the explored part of Cocklebiddy Cave is part of a much larger system.

Introduction

Cocklebiddy Cave (Latitude 32° 03'S, longitude 126° 02'E) lies near the western side of an extensive arid to semi-arid limestone plateau known as the Bunda Plateau or Nullarbor Plain. The cave descends northwards from a large collapse doline to a lake some 100 metres below the plateau surface. The lake is saline (on 1 May 1966 the water contained 11,650 ppm total dissolved solids) and its surface coincides with the regional watertable developed a few feet above sea level. I was surprised, therefore, to find that the level of the lake fluctuated by several centimetres in a matter of a few hours and, in 1965, I made a series of observations on water level, atmospheric pressure and air movements in an attempt to understand the mechanism.

Description of the Cave

A description of the cave and speculations on its development have been published earlier (Lowry, 1964). It has a simple linear plan about 410 metres long and 50 metres wide, and has a roof height of up to 16 metres (Figure 1). The final 200 metres of cave length contains a lake 5 to 10 metres deep. The floor of the cave and bed of the lake consist of fallen blocks of limestone together with minor deposits of red clay and debris transported by an intermittent stream. This intermittent stream is fed by surface runoff that flows into the doline at times of heavy rain.

I have argued (Lowry, 1964) that the space occupied by the present cave has been created by collapse into an earlier-formed cave that was dissolved out at a level some distance beneath the present watertable (See Figure 2).

One feature of the cave is important to the following discussion. In several places strong draughts blow in or out of the rockfall forming the

* Correspondence on this paper should be addressed to D.C. Lowry, C/- Editor, "Helictite."

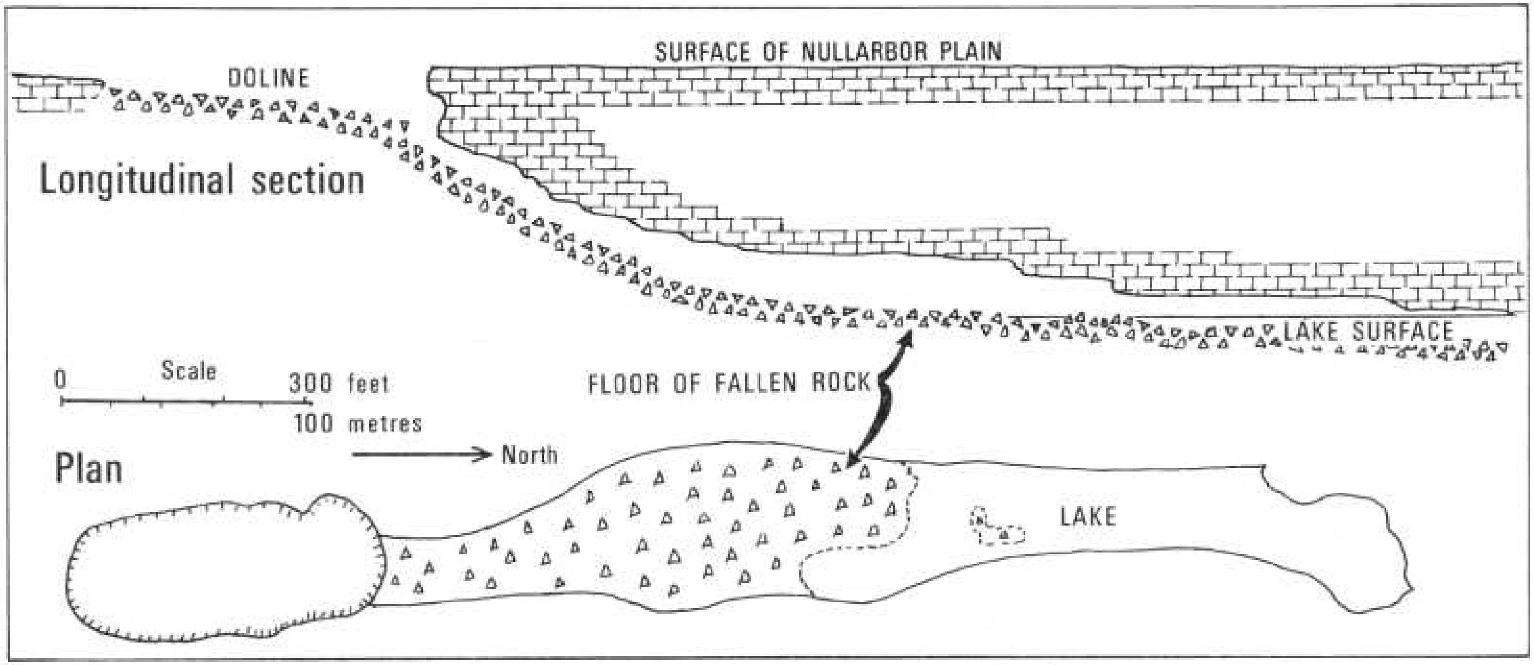


Figure 1. Plan and section of Cocklebiddy Cave. Adapted from Lowry (1964).

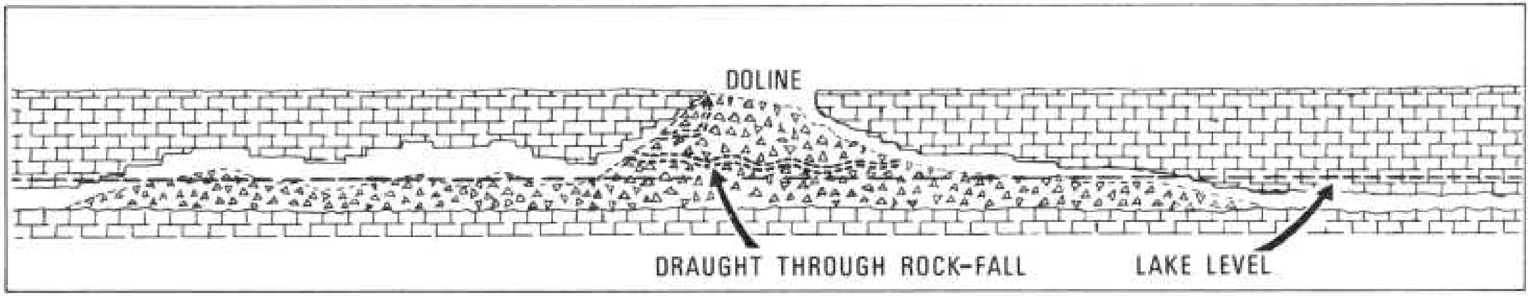


Figure 2. Diagrammatic section of Cocklebiddy Cave indicating an inferred, inaccessible cave extending south from the doline.

floor of the cave and doline; one place is at the southern rim of the doline and another is in the cave about 45 metres from the lake edge.

Methods and Results

The lake level was measured with a survey tape hanging in the water. Air pressure was measured with an aneroid altimeter. The velocity of the draught blowing through the rockfall near the lake edge was estimated subjectively as zero, barely perceptible, gentle, moderate, strong, or very strong. Records were made at about two-hourly intervals for a period of some 26 hours between 0915 hours on 24 August 1965 and 1100 hours on 25 August 1965. The results are plotted in Figure 3.

Conclusions

At the outset of the observations it was thought that the lake level fluctuations might be due to tidal effects, or to air pressure fluctuations in the cave caused either by the fluctuation in pressure of the external atmosphere, or by some venturi effect of the wind blowing across the entrance. However, fluctuations in surface winds had no observable effect on the air pressure in the cave, and pressure changes within the cave corresponded with fluctuations in external air pressure. Figure 3 clearly shows that the lake level is governed by changes in atmospheric pressure, and that an increase in air pressure causes a depression of the lake surface.

The simplest explanation for this relationship seems to be that the lake in Cocklebiddy Cave is connected to an extensive cave system having a lake and a large reservoir of air that is not freely connected to the surface atmosphere. Such a cave could be developed along the same joint or group of joints as the known cave and could lie to the north or south or both.

The draughts through the rockfall evidently represent a leakage from such a reservoir formed by a cave extending to the south. During the period 1525 to 1940 hours on 24 August, the water level dropped 25.4 mm in response to an increase in air pressure equivalent to a column of 2.8 mm of mercury or 40 mm of water. If the model suggested above had applied ideally, the lake level depression would presumably have been 40 mm, and the discrepancy between the model and reality might be explained in part by leakage of air through the rockfall. Draughts through the rockfall are absent when the reservoir is at the same pressure as the air in the main cave. Thus at 0340 hours on 25 August, equilibrium was almost reached with the air pressure in the main cave at 771.1 mm of mercury, but the atmospheric pressure then rose, forcing more air through the rockfall. At 0900 hours the pressure began dropping and equilibrium was established at about 1000 hours at a pressure of 771.4 mm of mercury. This evidence that equilibrium can be obtained at different external pressures is a further in-

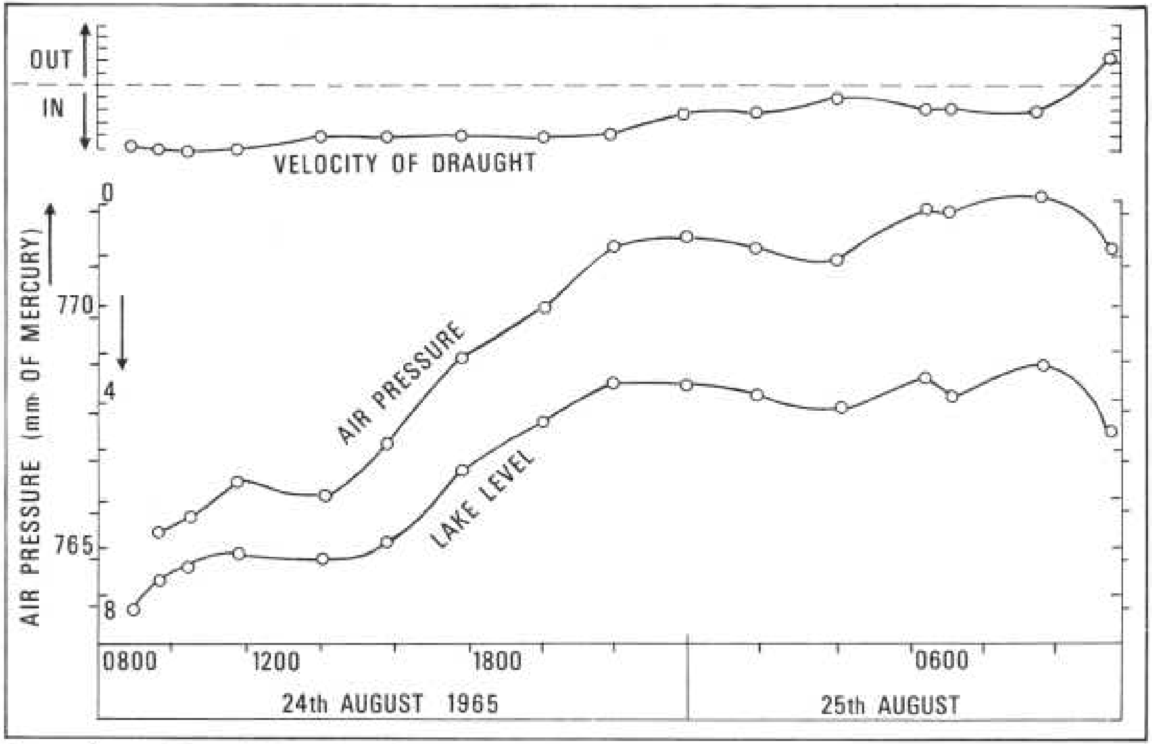


Figure 3. Plot of fluctuations of lake level, air pressure, and velocity of draught through the rockfall. The velocity was estimated subjectively (see text) and is plotted on a non-linear scale. The lake level datum is arbitrary.

dication that the volume of air passing through the rockfall is a small but significant fraction of the total volume of the reservoir.

Measurements of the flow rate of air through the rockfall could give an indication of the size of the inferred cave to the south. The draught near the lake edge passes through gaps some 5 to 20 cm wide between limestone blocks, and the noise at times is audible at a distance of 5 to 10 metres. My subjective estimate is that the volume of air in the cave to the south is likely to be at least as great as that in the known cave, and probably several times greater.

Reference

LOWRY, D.C. 1964 : The Development of Cocklebiddy Cave, Eucla Basin, Western Australia. Helictite, 3 : 15 - 20.

+++++++++++

R E V I E W S

PROPHETIC VISION IN THE SOLOMON ISLANDS. Anon. ("Notes on the News"). New Scientist, 41 : 215. 1969.

Brief review of dig by D.W.H. Davenport, Oceania Curator of Pennsylvania University Museum, at Poha Valley site on Guadalcanal Island, Solomon Islands (museum Bulletin, 11 (1)). Reference is made to cave sites on some of the smaller Solomon islands which have been occupied continuously by Man since before AD 140. Archaeological exploration into the lower levels of these caves is said to show that the islanders have for long eaten pig together with edible seafood. Their artefacts, such as they were, were made of chalcedony and volcanic stones simply fractured by fire. Blades of giant clam shells and whetstones of imported rock were found also. On Santa Ana Island, a form of red pottery was in use between about AD 150 and AD 650. The presentday inhabitants have no recollection of this type of pottery. This note is most interesting, particularly when considered beside the papers of Ollier and Holdsworth in Helictite on the Trobriand Islands, which are also in the southwest Pacific area .- E.A.L.

THE CAVES OF KARAWARI. By E. Haberland. D'Arcy Galleries, New York. Pp 19 and 105 photographs. 1968.

Though a very attractive book, it is completely misnamed. The only reference to caves is in the title and on a crude location map showing the location of the caves on the Karawari River, a southern tributary of the Sepik River in Australian New Guinea. We even have to infer that the magnificent wooden cultural objects which are illustrated in black and white were recovered from these caves; the text says nothing about this. The carvings, religious in purpose, exemplify that close adaptation of style to the characteristics of the materials used which characterises great art.- J.N.J.

NOTES ON A LARGE CAVE IN THE KERIAKA LIMESTONE, BOUGAINVILLE ISLAND, SOLOMON ISLANDS

F. PARKER

Daru, Territory of Papua and New Guinea

On the west coast of Bougainville Island, Solomon Islands, between the Ukaukama and Laruma Rivers, is a limestone outcrop up to 4,400 feet high and covering an area sixteen miles long by up to eight miles wide. At Cape Moltke the limestone reaches the sea with cliffs up to 100 feet high and some islets of single, sheer-sided limestone blocks with caps of vegetation. Ten miles southeast of the limestone is Mt. Bagana (5,000 feet), an active volcano, and six miles north is another active vent, Mt. Balbi (8,000 feet). Maps of the limestone area show numerous dolines and depressions, some quite extensive. Waterways enter many of them. The geology of the area was discussed briefly by Blake and Miezitis (1967).

On 23 September 1963, after returning from a visit to the craters of Mt. Balbi, I led a small patrol from Koripobi village southeast to Cape Moltke, then inland along limestone ridges and small creek beds for most of a day to reach the largest of these depressions.

The village people of Koripobi had described the depression to me as once having been the bed of a large lake, on the shores of which there had been some small hamlets. According to legend, one day the lake had commenced draining fairly rapidly. After the people got over their first fears, they climbed down after the retreating waters to catch the fish and eels left stranded. The waters gushed out of the limestone to form the Kara River, quite near the coast.

I also visited the point of emergence of the river and found a large cave in a 100 feet high cliff from which emerged a slow-flowing, deep, bright green river. By means of a raft made of wild banana tree trunks, we followed the river upstream into the cave for about 150 feet to a collapse chamber with a chimney opening at the surface about 100 feet above the river. About 70 feet up the chimney, the opening could be seen of what appeared to be a horizontal passage.

A pair of large water frogs, Discodeles guppyi, were taken on ledges near water level in the chamber. The water rose from a sump in the eastern wall of the chamber. No diving was attempted as large saltwater crocodiles had been reported near the cave.

On arrival at the large depression, we entered it from the west, climbing down the steep side through mud and tree roots to a steeply sloping track, then down another steep drop to river level. The soil along the track was of very fine consistency, forming a very adhesive mud, while the rain forest appeared quite young, with few trees as large as those in the forest on the lip of the depression.

In a vertical cliff 600 feet high forming the southeast wall of the depression was a cave mouth 300 feet high and 350 feet wide. Falling over the mouth of the cave was a fine mist of water from small creeks falling over the cliff face above the cave. Inside the cave, on the north side, was a pile of rubble more than 100 feet high with a comparatively sparse growth of forest up to 30 feet high. Trees were cut down to bridge the river about 200 feet in from the cave mouth. A large rubble pile about 140 feet high filled most of the southeast part of the chamber. Camp was made among sand dunes with low scrubby growth at the base of the pile. After a night in the cave, the party awoke to find everything soaking wet from fine precipitation from cloud high above in the roof of the cave.

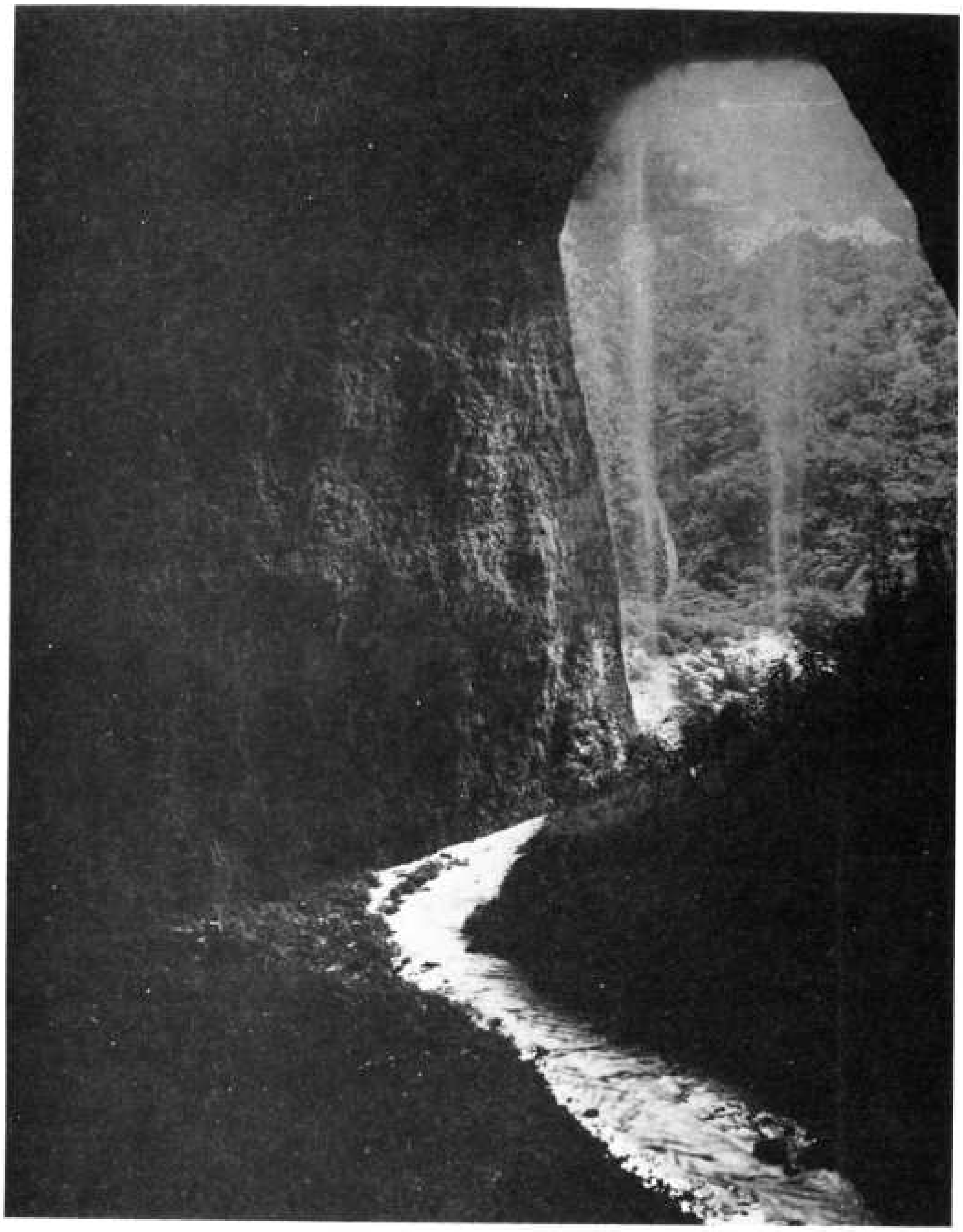
A hemispherical mound of pale brown flowstone about 10 feet high near the eastern end of the chamber had been formed apparently by fairly rapid dripping of water from cracks in the cave roof. According to my native guides, the stone was believed to be related to the moon, and gifts of food were often left near it when villagers visited the cave.

The river rose from a sump in the east wall of the large, symmetrical chamber which, at its greatest dimensions, was 450 feet wide and 500 feet high. The full length of the chamber was near 900 feet. The river flowed out of the main cave, across the southeast corner of the depression, then into a passage 30 feet wide, 6 feet high and about 100 feet long, ending in a sump. The amount of water in the river was consistent with the size of the Kara River where it emerged two miles to the southwest.

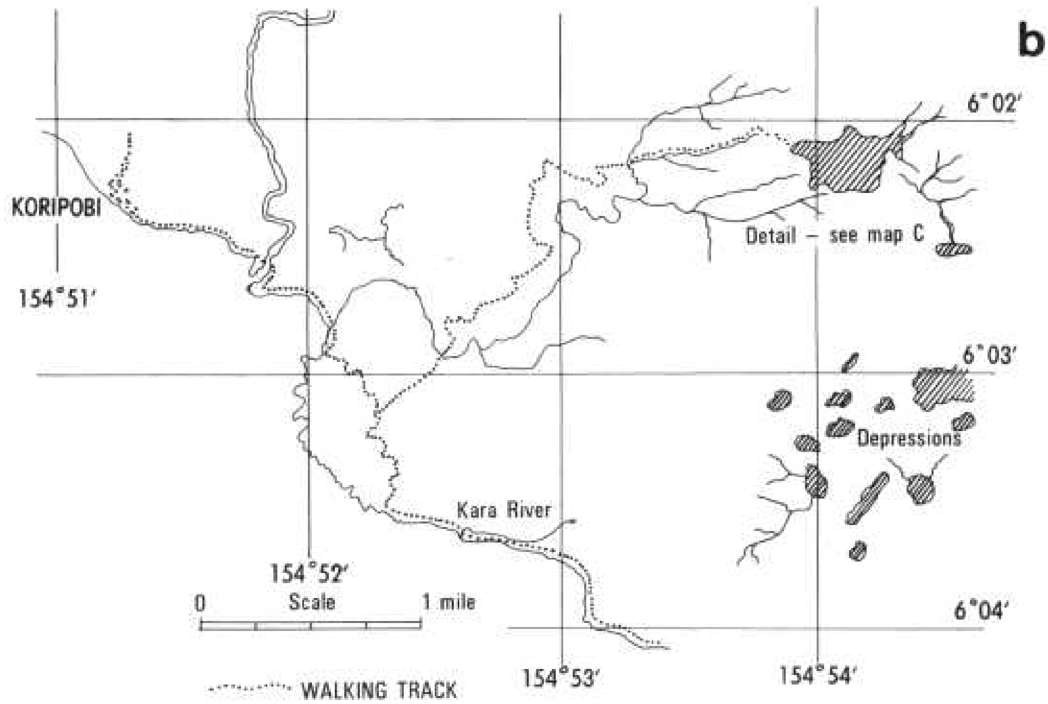
Reference

BLAKE, D.H., MIEZITIS, Y. 1967 : Geology of Bougainville and Buka Islands, New Guinea. Bur. of Min. Res., Geol. and Geophys., Bull. 93/Bull. PNG 1. Review of this publication by E. A. Lane in Helictite, 6 (2), 1968 : 33 - 34.

Caption, opposite page. Looking towards the mouth of the cave. A mosaic of black and white prints prepared from three colour transparencies taken by the author from the summit of the rubble pile against the south wall of the chamber. See "x" in Figure C, vertical cross section. The camp site, with smoke rising, and native carriers can just be seen to the left of the river, in the lower left portion of the cave. The log bridge lies across the river in the foreground.




a
KUNUA
Ukaukama River
MT. BALBI
6°
See map B
Laruma River
MT. BAGANA
KIETA
TOROKINA
BOUGAINVILLE IS
155°
0 Scale 20 miles
156°


b
6°02′
KORIPOBI
Detail – see map C
154°51′
6°03′
Depressions
Kara River
154°52′
0 Scale 1 mile
6°04′
WALKING TRACK
154°53′
154°54′

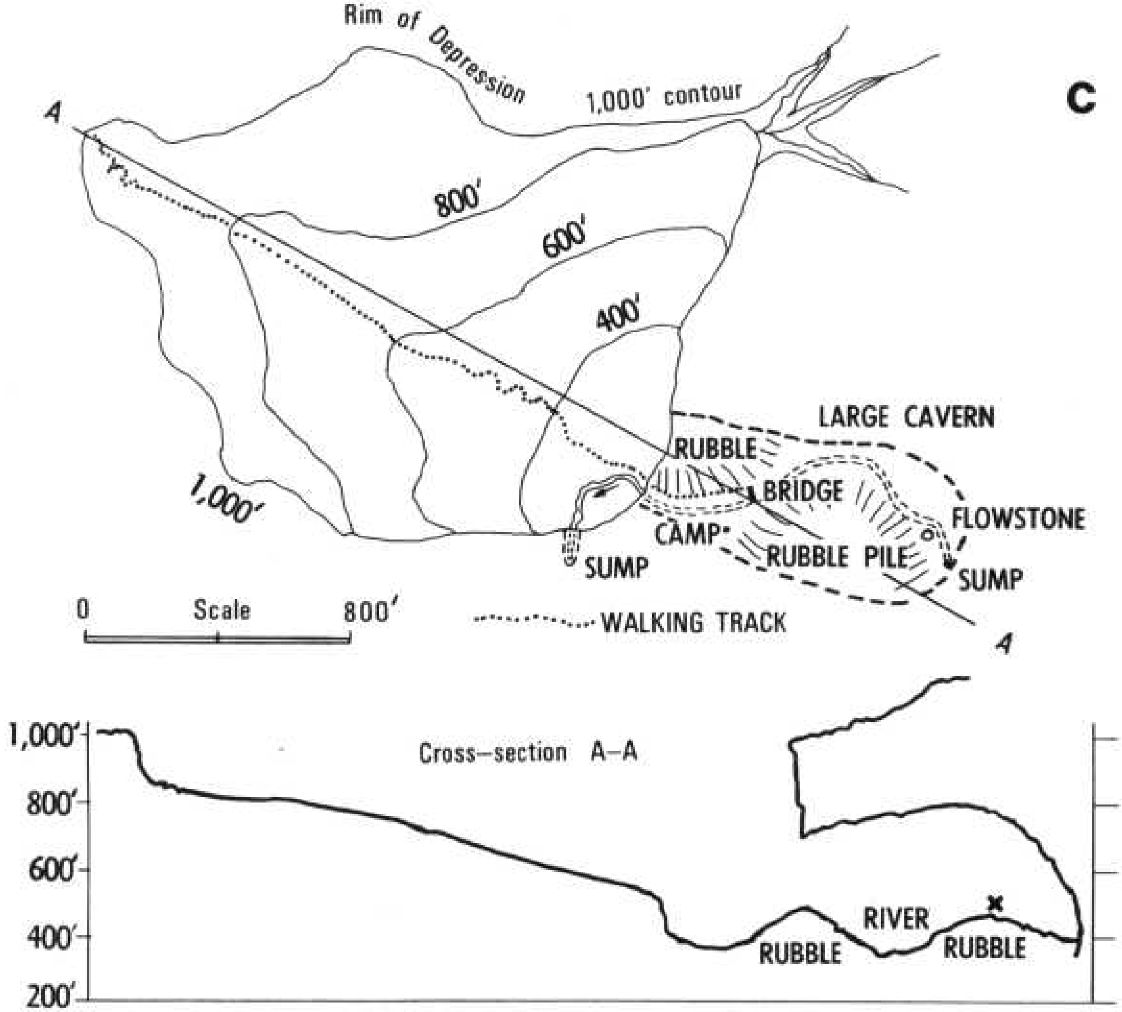


FIGURE A. Bougainville Island, Solomon Islands, showing main centres and extent of Keriaka Limestone.

FIGURE B. Cape Moltke area, Bougainville Island, showing the main depression and walking tracks.

FIGURE C. The main depression, showing the cave and vertical cross-section.

A B S T R A C T S

POPULATION RANGES OF MINIOPTERUS SCHREIBERSII (CHIROPTERA) IN SOUTH-EASTERN AUSTRALIA. By P.D. Dwyer. Aust. J. Zool., 17, 1969 : 665 - 686.

In south-eastern Australia banding of M. schreibersii has been concentrated in four areas: north-eastern New South Wales, south-eastern New South Wales, south-eastern Victoria, and south-western Victoria and south-eastern South Australia. The present paper analyses 2,083 reported movements. Only 17 of these are from one of the four areas to another with the longest movement being 810 miles.

Biologically and geographically separate populations of M. schreibersii are recognised in both north-eastern and south-eastern New South Wales. Each population has its basis in dependence upon a specific nursery site which is used annually by nearly all adult females in that population. Boundaries of population ranges in New South Wales are considered to be prominent features of physiography (i.e. divides). Bats move between population ranges less often than they move within population ranges. This cannot be explained solely in terms of the distances separating roosts. Available movement records from Victoria and South Australia are consistent with the pattern described for New South Wales. Two biologically recognised populations (i.e. different birth periods) occur in south-western Victoria and south-eastern South Australia but these may have overlapping ranges. Only one nursery colony of M. schreibersii is known from south-eastern Victoria. On present evidence it remains possible that the apparent integrity of the population associated with this nursery is merely a consequence of distance from other areas of banding activity.

Detailed analyses of movements in bats may provide direct evidence as to the kinds of cues by which a given species navigates. Thus the physiographic basis described for population ranges in New South Wales is consistent with the view that M. schreibersii may orientate to waterways or divides or both. The probability that there are area differences in the subtlety or nature of navigational cues is implied by the different physiographic circumstances of south-western Victoria and south-eastern South Australia. It is suggested that knowledge of population range boundaries may aid planning of meaningful homing experiments. - Author's Abstract.

PLATYPUS IN CAVES. By E. Hamilton-Smith. Vict. Nat., 85, 1968 : 292.

This note records a live platypus and a dead one from Dalley's Sinkhole (M 35), Murrindal, Victoria. The platypus tick, Ixodes ornithorhynchi, was also collected. The platypus has also been reported from Junction Cave, Wombeyan, N.S.W.; Moon Cave (B 2), Buchan, Victoria; and Croesus Cave, Mole Creek, Tasmania.- A.M.R.

==========