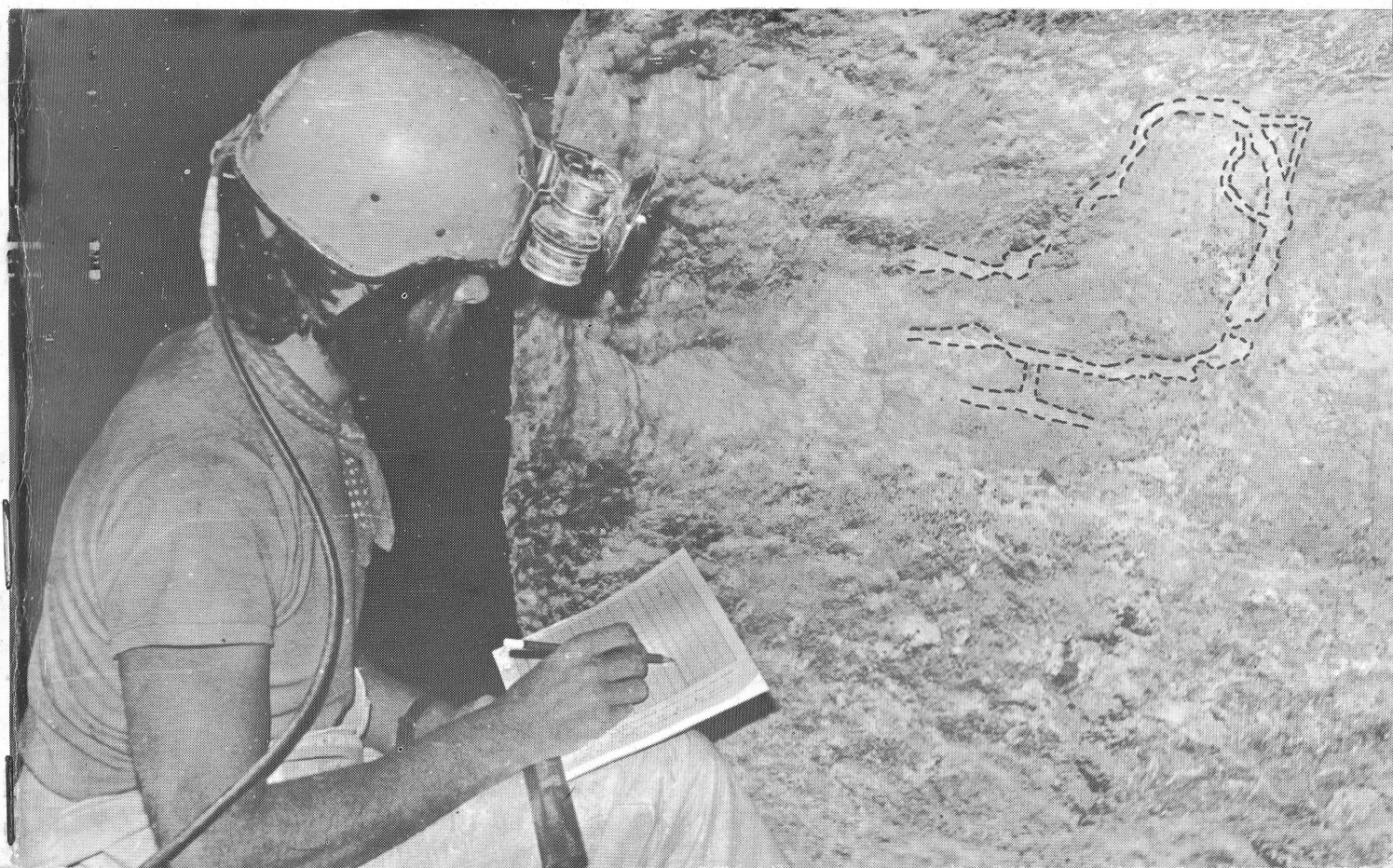




NEWSLETTER OF THE PAPUA NEW GUINEA CAVE EXPLORATION GROUP

Volume 4 Number 4

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Niugini Caver is the newsletter of the Papua New Guinea Cave Exploration Group, an informal association of persons engaged in speleology in P.N.G.

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Cover Photograph. Kevan Wilde copies an engraving at Site 1, Selminum Tem, Hindenburg Range. The engraving is said to represent a "kawel" (hornbill) and has been picked out in black ink on the photo for clarity. A certain amount of distortion is due to the angle from which the photo was taken (see article, p155).

Photo by Chris Pugsley.

* * *

TOKTOK BILONG EDITA - BAI MITUPELA I GO PINIS NAU

Next month Jean and I will be going finish and handing Niugini Caver over to Malcolm and Alison Pound together with the PNGCEG library and equipment. We'll be sitting in Australia for a bit before heading over to Europe and Sheffield for the International Union of Speleology Congress and a "liklik raun". Our Australian address will be:

120 James Street,
TOOWOOMBA. QLD. 4350. AUSTRALIA.

I'm very pleased that N.C. will be continuing and wish Malcolm and Alison as much pleasure and satisfaction with it as we have had. The maps and cave descriptions of the old Port Moresby Speleological Society from Chuave and Javarere have yet to be published and there are the reports from this year's two expeditions as well as the usual articles from active P.N.G. cavers, so it would have been a great pity if N.C. had faded at this stage. Besides which, our work from the Gazelle has to be written up yet and a journal of high standing is needed for this (ho-hum)!. The new address for N.C. is:

P.O. Box 3824,
PORT MORESBY,
PAPUA NEW GUINEA.

You may be wondering about Volume 4, number 3. This issue is devoted to the '75 Lelet expedition. With 30 photographs and 11 pages of maps and 39 pages of text, it's a rather special edition. It is with the printer now and should be out about the same time as this issue. It is being sold for K2.50 (Aust \$3) a copy - more than the annual subscription to N.C. We're sending it to all subscribers to N.C. and asking that people who think it is worth K2.50 (\$3) send this to me or Lex Brown as we have put up the money for the issue.

On the subject of money, it is necessary to raise the subscription to N.C. as I am several hundred kina out of pocket this year. The new rate will be K3.50 p.a. or equivalent in Australian dollars (Aust. \$4.00 on today's rate). When the P.M.S.S. folded at the end of 1969 there was K178 left in the bank account. I wrote to the bank enquiring about this recently and received in reply the balance of the account - K2.18. The rest has gone on cheques drawn on the account (by whom?) and bank charges.

That's it for another year. ...

Merry Christmas from us and may '77 be a good caving year for the PNGCEG.

R.M.B.

* * *

PRELIMINARY REPORT ON THE 1976 EXPEDITION TO THE MULLER RANGE

Kevan A. Wilde *

The People. Julia James (leader), Neil Montgomery (leader), Kevan Wilde, Randall King, Stuart McCann, Neil Hickson, Malcolm Handel, Peter Ruxton, Dave Rothery and Richard Wilson, all from Sydney except for Kevan.

The Time. From about 27th July to 1st September, 1976.

The Objectives. (1) Re-cut the track to Camp Horatio; locate and explore major shafts in the immediate area, including the fault controlled glade where two systems, Uli Guria (MR105) and Kanada Heiowa Heia (MR118) were explored and surveyed to over 300 m depth by the Niugini Speleological Research Expedition, 1973 (Montgomery, 1974).

(2) Cut into the south-east corner of "The Cheese" (Mamo is the real name) with the ultimate aim of exploring the stream sinks located on aerial photographs after the '73 trip (see Map 1 in the NSRE 1973 report).

The Results. We didn't make the Horatio area nor the stream sinks, but the area appears to be promising with many shafts and a capping of siltstone to provide the run-off. Deepest shaft recorded at Mamo was -76 m. Some 4-5 km of passage was explored and surveyed in the Atea and the main passage was pushed for about 300 m until exploration became hazardous without dinghies and telephone communications. Total known length of the main Atea passage is now about 450 m.

The Story. The advance party went in about a week before the main expedition but were confused by the porters as to the true location of Camp Horatio. When the main party arrived it was split into two groups: one group went to the south-east corner of "The Cheese" and the other to push through to Horatio. After a few days cutting and shaft bashing, a couple of members had a look at the Atea (MR300) and were able to get into a high, dry upper entrance (noted on the '73 trip) along the eastern wall on the Atea Doline. It was decided to pull back to the Atea, establish a camp at Lumbi, and concentrate the expedition's resources and manpower on an all-out exploration push of the Atea.

The Atea Kanada. The Atea Kanada, which is the correct name as opposed to the Kanada Atea used previously, is possibly part of a master system with many stream inlets, and a complicated network of vadose and phreatic passages. A river passage flowing from the north-east was explored for over 2 km and may connect with a stream sink east of Okaparu (?). The entrance complex consists of dry phreatic and recently stream invaded, phreatic passages with inter-connecting levels of some 2 km in total length. Accordingly it is envisaged that the cave may continue with many by-passes to the main river passage.

The Atea River was found to be accessible from a number of the side passages, and in two cases through high level windows followed by an abseil of some 15-20 m. The first descent into the main passage revealed a relatively placid

* P.O. Box 1055, Goroka, E.H.P., P.N.G.

stream that was negotiable by swimming upstream to the limit of the '73 exploration. (The party located the end of the original traverse rope hanging above the water.) I estimated stream flow to be less than 2 cumecs. The original report quotes 12 cumecs, but exceptionally dry weather was encountered this year and the original estimation may have been slightly exaggerated. (I'll stick by our '73 estimate! Editor)

The second high level window gave access to a point approximately 130 m downstream and adjacent to a waterfall. At this stage the Atea was presumed to sink into a deep shaft. However it was found to disappear into a slot some 4 m wide, only to reappear further down where it flows through a series of potholes some 15 m wide and of similar depth (?). The passage is of the order of 20 m high and 10-15 m wide and is thought to be the original river course. It serves as an overflow for the slot which is probably a more recent course. A large chamber is encountered at this point.

Heavy rain and a consequent rise in river level precluded further exploration of the main river passage. In any case, it was decided that dinghies and telephone communications would be required for a serious push. It is interesting to note that even after heavy rain, both the side and main streams were relatively safe to negotiate, although somewhat frightening, but it was obvious that the entire system could flood to the roof - logs wedged high in the roof testify to this. Erosion and sedimentary deposits on the walls reveal that the main stream flows regularly at a depth of greater than 1 m above the level at the time of exploration and is capable of reaching a height of 2-3 m, with occasional flooding to the roof 15-20 m above the floor level. High level ledges may provide respite during floods and fixed traverse lines with regularly spaced emergency camps would be necessary for serious and continued exploration.

Conclusions. Underground exploration and surveying was followed up by a surface traverse and survey to the Nali resurgence. The tentative results firmly establish the Atea Kanada's vertical potential to be in the order of 1000 m over a distance of some 2 km. No substantial vertical development was encountered during the exploration of the main passage, therefore pitches of considerable length may be anticipated before more substantial horizontal development is achieved. Thus the chances of sump are considerably reduced and, in any case, the possibility of high level by-passes is favourable. A number of the expedition members consider that there is a relatively good chance of a connection with the shafts in the Horatio and fault controlled glade areas where the proven potential is in excess of -300 m. Whatever the case, the prospects of a 1000 m deep cave are stimulating enough to warrant a major expedition.

The Atea can only be described as being both challenging and exciting, and must be one of the most promising unexplored caves in the world. So, July-August 1978 is the time and the Atea Kanada is the target for the next expedition. Julia James is the organizer, Neil Montgomery will probably be the underground leader and I will be the P.N.G. liaison officer and adviser.

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* * *

1976 NEW IRELAND SPELEOLOGICAL EXPEDITION: A PRELIMINARY REPORT

T. Sprod *

This article is a personal summary of this year's Lelet expedition. We hope the full report, with cave surveys and descriptions, will be published in Niugini Caver next year.

The 1976 NISE had ten starters. They were Dave Gillieson, Jill Landsberg, Rob Canty (all University of Queensland Speleological Society), Ralph Page (Chillagoe Caving Club), Neil Hickson (Sydney S.S.), Stewart Wilson (Southern Caving Society and U.Q.S.S.), Mike Bourke, Jim Farnworth, Dave Larken and Tim Sprod (all PNGCEG). Mike and Jim only came for the first week, while Dave only managed to get down a couple of holes on the coast, due to pressure of work on his plantation. Rob had to leave on 12th July, also due to pressure of work. So six of us saw out the whole trip.

We left Rabaul on 27th June and soon discovered Rob's map reading abilities - later to prove invaluable. He had to navigate for us, because the ship's owner had neglected to tell the captain where we were going. We made it though, and Dave Larken picked us up and transported us to Lamerika - our base for the first week.

The next morning we split into two groups and went looking for holes. We wanted to check out the resurgences on the coast, and the biggest of these was the Dalum resurgence. One group went to explore Dalum, while the rest of us decided on Pum Hill. There we found an impressive entrance (Lamlamsik, previously reported as Pamp Cave (N10) by Bourke and Gallasch, 1974) with water cascading out of it and down the hill. However, the cave itself got quite tight quickly and also kept splitting. We pushed each branch until it got too tight and then went to look at some others. None of them were any good, although at Lemeris we found a 10 m hole on the beach, and Mike stumbled across a rainmaker's place, with clam shells, human bones and some very old Malanggan carvings. The others had been some way into Dalum which turned out to be a large maze of a cave, in many cases filled with water to depths exceeding 20 m - no sign of a bottom. It eventually sumped upstream, but is undoubtedly a large cave taking a lot of water from the plateau. Many of the small side passages were not pushed and there may be a way on. Some 600 m of passage was explored and 242 m surveyed.

After the first day word spread locally that we were looking for caves, and we were offered many holes. All those we saw after that were good and we were drawn to commenting on the desirability of coming to New Ireland for a holiday - one day on the beach and the next caving. Those which we did see were Meabin (previously reported as Mamarabin (N11) by Bourke and Gallasch, 1974), an impressive large collapsed belled shaft with large passage full of bats off from the bottom; Merakambilin, whose entrance is another rainmaker's place, and which has four passages at the bottom of a 10 m ladder pitch, with total passage in excess of 350 m and two passages still going; Danmin (reported by Beron, 1975), a beautiful cave with a lovely river passage at the bottom which unfortunately sumps very soon. There is a fair bit of water in it and we went downstream fully prepared -

* 686 Sandy Bay Road, Sandy Bay, Tasmania, 7005. Australia.

in life-jackets with a "guni" (rubber inner tube) tied on a rope. Upstream the river flows through rockpile which may be pushable - it looks unlikely. Danmin was surveyed as 174 m long and 60 m deep.

On 1st July the advance party set off for the Lelet. The party consisted of Mike, Jim, Neil and myself. The idea was to get to Kandalum, our camp site and water source, that night if possible, to prepare the camp for the main party. We had our own gear and several extra loads, and Dave was going to drive us to Limbin. Unfortunately it poured the night before and we were only able to get a bit over half way in the Toyota. We walked the rest and on to Lenkamin where we met with Lakuna, who had greatly helped last year's expedition. Talking to Thomas, another of the previous year's guides, we discovered a major error - the water source we wished to camp at was called Lababat, not Kandalum.

The next morning there were some problems about guides. Eventually a reluctant guide was provided - Nau. He had been told by Lakuna the Lelet equivalent of "You go to the top of the scarp and take the first right - can't miss it." Unfortunately he did and we spent the night back in Limbin. Next day Neil and I became the rearguard party as the whole expedition moved up to Lababat. Mike and Jim at this stage returned to Lamerika. Soon we were comfortably established in camp. Initially we employed three camp assistants, Thomas, Liman and Stephen. We soon discovered that only a handful of people from the villages - the hunters - knew their way around the high country. Thomas was one such person and we later employed Lentuang who was also a hunter. They proved invaluable and the other two were also very helpful, although Liman managed to get Ralph, Neil and Jill lost one night by taking a short cut.

At first we tried doline bashing and Stewie, Rob and I were heartened when our first hole yielded about 100 m of passage. However, Jill, Dave, Ralph and Neil bashed 14 dolines the same day without a decent hole. We soon realized these tactics were not productive and decided on heading for promising looking features on the air photos. It was then that we discovered that only Rob was capable of accurately navigating with air photos. Ralph, Stewie and Jill all tried and all ended up going in circles. Neil and I refused to even try and Dave was doing his thesis work.

Despite this change of tactics, we still spent a large amount of time checking small holes in dolines. Most of them choked with mud, stal or rock before going too far, and all took large amounts of water when it rained - even the smallest and nastiest. We developed two main theories as the time went on: (a) The holes with the larger drainage systems leading to them were more likely to go, and (b) All the holes have small entrances, but probably joined up underground and it was just a matter of finding one that we could get through into the big stuff under there. Although we must have entered somewhere between 100 and 150 holes, only six of them were considered worth tagging. The three best ones are Sunamokola (183), Labapivilis (186) and Lemeragamas (187). Sunamokola has two large stream passages flowing into it, which are normally dry. There are three entrances - a walk-in passage to a 10 m pitch, a 15 m shaft and a 22 m large shaft. The first two pitches lead to the bottom of the third after a 6 m climb. From there a large rift chamber leads down to a pool, then into stream passage with a 6 m pitch immediately after. The passage is 2 m by 3 m, clean, in beautiful smooth limestone and every pitch had an obvious tie off right next to it. Unfortunately it leads into a large, mud

filled sump chamber. Provisional length is 470 m and depth 78 m.

The entrances to Labapivilis and Lemeragamas were discovered with only a few days to go. Labapivilis proved a great cave to explore; it has three apparently unconnected entrances and involves some very sporting climbs and crawls. Unfortunately just after the third passage joins it, flowstone blocks off most of the way on. Surveyed length is 129 m and depth is 43 m.

Lemeragamas was discovered by Stewie on a lone reconnaissance while everyone else was having a rest day. The entrance is tight, as is the first pitch which Stewie amazingly free climbed.

The last four days of the expedition were used in exploring the cave. On the last day, it had been pushed to 652 m and 97 m in depth. It was decided to put two parties in; Dave, Stewie and Jill to survey and Ralph, Neil and myself to push it as far as possible. We went to the top of the last pitch - a 15 m estimated waterfall pitch into a chamber - and went to place a bolt. Unfortunately we then discovered that the new drill in the bolting kit was not the right size for the bolt. So we returned behind the survey party, derigging.

Lemeragamas is by far the best thing we saw and, where we left it, it was still going strong and getting bigger. It so far has six pitches (none very long) and three belayed climbs. Most of the depth, however, is gained in walking passage. Although we were disappointed in not pushing it, it provided a high point for the finish of the expedition. It could go a long way and is definitely worth a return trip. We ended the trip convinced that there are deep caves on the Lelet, but finding them and getting into them will be difficult. The expedition, or what was left of it after Neil left for the Muller trip and Ralph stayed at Lamerika, came back to Rabaul on 24th July after spending a day at Dalum resurgence relaxing and washing ropes and gear.

We would like to acknowledge all those who gave us help during the trip. In particular, Dave Larken provided a great deal of assistance, in time, money and material although he wasn't able to get down many holes or even on to the plateau.

Nau, mi laik tok "tenk yu tru" long ol man bilong Lelet. Thomas na Lentuang, tupela man i save tru long ol pasin bilong bikbus, na mipela hamamas tumas lonc wok wantaim ol. Stephen na Liman tu i helavim mipela planti, na mipela laik tok "tenk yu" long ol. Ol man i karim kago na ol man i helavim mipela long olgeta narapela samting, mipela laik tok "tenk yu" long yupela tu.

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- Bourke, R. M. and Gallasch, H. (1974). Caves of the New Ireland District. *Niugini Caver* 2(3): 193-205.

* * *

A BRIEF HISTORY OF SPELEOLOGY IN PAPUA NEW GUINEA

R. Michael Bourke *

Man has been in New Guinea for at least 27 000 years (White *et al.*, 1970), and has presumably been using caves for much of this time, so it would be somewhat pretentious to write a history of cave exploration in Papua New Guinea. Even to compile a history of caving by Europeans would be a near impossible task for hundreds of Europeans have explored caves in the century since they started settling in the country. However I shall attempt to record the activities of speleologists in P.N.G., that is, people who explore caves as a sport and record their findings.

There were speleologists in the country before 1960, but there is no record of their caving activity, if indeed there was any. In April 1957 an American caver wrote to David Taylor, an Australian caver based in Port Moresby, seeking information on caves here. Taylor did not give any specific information on caves in his reply, but he did state that "People who have seen the numerous entrances are too concerned with keeping alive to be bothered with exploring them or even plotting them".

THE P.M.S.S. AND G.C.C.: 1960-1969

The first step taken in the formation of the Port Moresby Speleological Society (P.M.S.S.) was the meeting of John Barnaby (ex S.U.S.S.) and Gordon Bain (ex W.A.S.G.) in December, 1959 (P.M.S.S., 1960). The first formal trip of the Society took place in January, 1960 when an eight member party led by Gordon Bain went looking for caves near Dagoda southeast of Port Moresby. In the words of the leader: "The trip was completely unsuccessful". However before the month was out, the first trip had been made to the caves beyond Javarere Plantation. The idea of forming the Society as a Division of the Youth Hostels Association of Australia was eventually discarded and the Society emerged as a separate entity, although close ties were maintained with the Y.H.A.

A total of 20 trips were run in the first year, 19 to Javarere and 1 to Chuave in the Eastern Highlands. This and future highland trips from Port Moresby were run as follows: A DC3 charter was arranged from Port Moresby to Goroka and spare seats on the plane filled by members of the public. Profits from the charters helped finance the Society. The Javarere trips averaged eight participants each and Old Cave was surveyed on one of the trips. Reports of caves on New Ireland, the Western Highlands, and the Mumeng and Chuave areas were sent to the Society by members based in various parts of the Territory.

Gordon Bain became the Society's secretary/treasurer in 1960 and in 1962 he was elected as president. Bain was the key member during the first four years of the Society's existence. In December a comprehensive report was prepared for the Australian Speleological Federation (A.S.F.) Convention and the P.M.S.S. was accepted as a member subject to certain constitutional changes.

* D.P.I., Keravat, E.N.B., Papua New Guinea.

"1961 was a rather unrewarding year in the Society's history and, while exploration of the Javarere caves continued, the group did not function too well as a Society" (Bain, 1962). There were 11 trips during '61, mostly to Javarere with two to Hombrum Bluff. At Javarere the Art Gallery Cave was surveyed. The first issue of the Society's newsletter Cave Talk-Talk was produced. There were also 11 trips in 1962, 8 to Javarere and 3 to Chuave. One of the Port Moresby members, Kevin Read, transferred to Goroka in late '62 and an active Goroka based group was started. Gordon Bain represented the Society at the 4th Biennial Meeting of the A.S.F. at Kempsey in December, 1962.

Activity during the first three years of the Society's existence had been predominantly at Javarere, although there had been five trips to Chuave up to January 1963 (Bain, 1963a). However in '63 activity shifted to the highlands and there were only three Javarere trips. A Goroka branch of P.M.S.S. was formed in January and was very active in that year (Read, 1963). There were 10 members and Kevin Read was the group's motivating force. There were numerous trips to Chuave and Henganofi and a number of surveys were done, including Kaimomo Cave. Discussions were held with the District Commissioner in Goroka concerning the tourist potential of the Chuave caves. Three issues of Cave Talk-Talk were produced in Port Moresby and one included a review article on the Chuave area (Bain, 1963a).

There were also some trips to other areas in the Territory. In May, Chris Borough organized a trip from Keravat to the Baining Mountains of New Britain, although no caves were entered; Borough led trips to the caves near Buang (Morobe District) in August and September; Laurie Le Fevre took a party to caves near Baiyer River west of Mt Hagen in December; and Fred Parker was active in the Bougainville area at this time (Parker, 1963).

At the 1963 annual general meeting of the P.M.S.S., a Goroka based committee was elected and the complete records of the Society were sent to Goroka. This committee folded in mid 1964 and the records were returned to Port Moresby. About this time the Goroka group started using the name Goroka Caving Club. The Group was quite active in '64 and there were many trips in the then Eastern Highlands District. Fred Parker was particularly active and did a lot of exploration in various parts of the E.H.D. and Porol Range in '64 and '65.

Members of the British '62 Gouffre Berger Expedition planned a British Overseas Caving Expedition to New Guinea lasting some 3-4 months commencing in June, 1964. It was planned to send 12 British cavers to New Guinea together with some Australian cavers (Bain, 1963b). Bain suggested that the trip operate at Chuave, Porgera and the Star Mountains. The trip did not eventuate, but out of it grew the 1965 Australian Star Mountains Expedition. This consisted of six members, three from Australia and three from T.P.N.G. Three of the six were cavers. Little caving was done and the caves explored were not large (Shepherd, 1974).

There was little caving activity between 1966 and 1968. Fred Parker did some in the Chimbu. Harold Gallasch started exploration on New Ireland in '68, and this has continued up to the present time. The most significant exploration about this period was that by Cliff Ollier and David Holdsworth in the Trobriand Islands. They made a number of trips to the islands between 1967 and 1971 and published the results of their work in a series of papers in Helictite and other

journals. In May 1968 Chris Borough and Kevin Read investigated a large efflux cave and an enormous doline in New Britain (Borough, 1973).

The Port Moresby Speleological Society was resurrected in early 1969. Charlie Legrady, Chris Borough and David Num were the committee members. Meetings were held regularly during the year and there were a number of trips. There were at least two Javarere trips, another to Cape Rodney, and two charters to the highlands where Chuave was visited. Members started using native names for caves about this time rather than giving new names to them as before. The revival did not last and the P.M.S.S. did not see the decade out.

THE P.N.G.C.E.G.: 1970-PRESENT

There was not much activity in 1970. Neil Ryan continued caving in the Erave and Kagua areas of the Southern Highlands which he had commenced in 1969. Michael Bourke started caving on the Gazelle Peninsula of New Britain and joined Harold Gallasch in trips to New Ireland. In 1971 activity started to pick up in a number of areas. Kevan Wilde and John Van Amstel commenced exploration in the Mendi area and a small group operated out of Mendi for some time. Wilde started caving in the Chimbu towards the end of the year. Members of the Explorers' Group of Nanzan University in Nagoya, Japan ran an expedition to P.N.G. in '71. They visited caves in the Chimbu and Mendi areas and did some biological work. On Bougainville Peter Robertson started visiting Nenduma Cave and a group visited the cave many times that year and surveyed it. On the Gazelle activity continued and some significant finds were made such as Obungeram. Two trips were run to the Raulei Range of New Britain.

The impetus of the previous year continued in '72. Wilde teamed up with Van Watson in the Chimbu early in the year and, together with Bill Sanders and Tony Maddern, they explored a lot of caves in the Porol Range. In August they bottomed Bibima at 494 m creating a new Southern Hemisphere depth record and put P.N.G. in the international limelight. Publicity from the trip resulted in contact being made between cavers in the islands and the highlands. Julia James's (S.S.S.) trip to the highlands in May laid the groundwork for the large Muller trip the following year. Bob and Viv Vincent made a number of trips to Javarere and did some surveying there. Activity continued on the Gazelle Peninsula and New Ireland. Bourke's reconnaissance trip to Ora Cave in April led to the third overseas expedition to P.N.G. - the 1972-3 U.Q.S.S. New Britain Expedition. The six member party explored the giant river cave and double doline in the middle of New Britain in December-January. One of the members developed an infected leg which necessitated her being carried out and resulted in much unwanted publicity for caving (Bourke, 1973).

Early in 1973 Niugini Caver commenced and the name "P.N.G. Cave Exploration Group", first proposed by Wilde and Watson, was used. The most significant activity that year was the 26 member expedition of Australian, P.N.G. and New Zealand cavers to the Muller Range. As well as turning up two caves over 300 m deep and other deep caves, numerous others were explored and eventually a book on the expedition published (James, 1974). There was some caving in the Porol Range, including trips down two deep caves that have still not been bottomed; John Bywater did some caving out of Madang; Mike Noone commenced

caving at Javarere; and there were three trips each on Bougainville and the Gazelle. As well a party spent several weeks looking at caves and the hydrology on the Waga River in the S.H.D. for the Commonwealth Department of Works.

'74 was the only year between 1971 and 1976 without an expedition, but there was plenty of caving activity otherwise. Geoff Francis started caving on Manus. Over the next two years he managed to explore, document and map a large number of caves in three karst areas on Los Negros and Manus Islands with the help of a band of high school students. There was the first Lelet reconnaissance trip and others to New Ireland and Lihir Island; and there were 10 trips on the Gazelle and 4 to Javarere. Mike Noone attempted to get a speleo group going at U.P.N.G., but without success. In the highlands things were quieter, but there were at least five trips in three districts, including one to the impressive Iaro River Cave near Erave. P.N.G. was represented by four cavers at the Australian Speleological Federation Conference in December.

There were two major expeditions in '75, the British one and the Lelet trip, both of which were preceded by reconnaissance trips. They are too recent to require a summary here, but both were successful, particularly the large British one. Otherwise the year was much the same as for '74 with a high degree of activity on Manus and the Gazelle and some activity on New Ireland and in the highlands. Malcolm Pound started caving at Javarere and there were some six trips there. The year finished with the P.N.G.C.E.G. meet in the highlands. Another two expeditions came here in '76 - one to the Lelet Plateau and another to the Muller Range. The local trips were restricted to a limited number of areas with activity confined to the Gazelle, Javarere and Bougainville.

SUMMARY AND DISCUSSION

Speleology in Papua New Guinea commenced in 1960 and was based in Port Moresby. In the first three years, activity was mostly confined to Javarere with some trips to Chuave, but in 1963 most caving was done at Chuave and Henganofi. In 1964-5 there was most emphasis on the Porol Range. It is suggested that the failure of the '65 Star Mountains Expedition to find significant caves resulted in reduced interest in P.N.G. caving for a number of years, both in P.N.G. and Australia. In the period 1966-69, the most significant activity was in the Trobriand Islands and caving was in the doldrums aside from some activity on New Ireland and the short lived revival of the Port Moresby Speleological Society.

Since 1970 caving has been characterized by small active groups in a number of centres motivated by one or two keen individuals. The other feature of recent years has been the expeditions - there have been seven over the last six years. Prior to 1970 the only published systematic information came from Chuave, the Porol Range and the Trobriand Islands. This has now been extended to Bougainville, the Gazelle Peninsula, the Southern Highlands, New Ireland, the Eastern Highlands and Manus and the published information on first mentioned areas has been consolidated.

The production of Niugini Caver by Michael Bourke and his wife Jean has been a unifying factor over the last four years. As well as acting as a vehicle

for describing the caves and caving activity and articles on cave related sciences, the newsletter has drawn attention nationally and internationally to P.N.G.'s caves and their vast potential, and has stimulated caving activity.

No mention of overseas visitors aside from the large expeditions has been made. Over the years there have been a number of visitors or residents who have been involved in cave related studies. Some of these were Hobart Van Deusen, Joe Jennings, Peter White, Susan Bulmer, Paul Williams, Balazs Denes and Peter Dwyer.

It is risky to predict the future, but expeditions of mostly overseas cavers should continue. The Americans have been threatening to come for years - perhaps they will one day. Local caving will probably be restricted to fewer areas with fewer expatriates in the country. The recent increase in participation by Papua New Guineans is likely to continue. The future for P.N.G. speleology can be nothing but good!

ACKNOWLEDGEMENTS

I have made much use of the unpublished reports and correspondence of the Port Moresby Speleological Society and the Goroka Caving Club throughout as well as articles published in this publication. Most of the old timers gave me information on early activity, although no other caver has seen this article prior to publication.

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* * *

THE CAVING SCENE

Central Province. In June Randell, Ruth and Henry Champion, Mivai, and Alison and Malcolm Pound did a weekend surveying trip to Old Cave at Javarere. The long river passage was surveyed and the party sighted an eel and a fish in the stream. The Pounds returned in July with Ian McCabe to continue the surveying. The upper chamber was tied in with the two entrances. Alison and Malcolm took a party of 15 up to the cave in October for a "tourist" trip.

East New Britain. Michael Bourke and Hal Gallasch took Randell Champion on a quick trip through Rarururunga at Keravat in June. Randell was duly impressed by the cave and bats. He suggested that it may be a maternity site because of the large numbers of bats and the presence of juveniles in the cave. The following Sunday Jim Farnworth, Tim Sprod and Michael Bourke returned to the cave to complete the survey. Length was about 300 m. A number of stream flow recordings were made. A note was made on various members of the rich fauna encountered in the cave - including a nine legged spider that Jim claimed to have seen!

In the big earthquake of 19th July, a hole appeared in the ground near Tavurvur Volcano near Rabaul. A shaft 5 m x 4 m at the top dropped 12 m to water level. Tim Sprod descended the shaft in July and again in October together with Michael Bourke, Vic Dent and Don Flanagan. The feature was surveyed and Vic and Don dived the water in the bottom, but it was too hot to swim in at the bottom - at least 60 °C. It appears that the earthquake opened up a pseudo-karst cave to the surface. Tim and Michael also had a look at the nearby cave in the lava flow. (This was erroneously reported as being a lava tunnel in The Caving Scene N.C.4(2)).

Michael and Tim drove out to the Rembarr Range to look for reported caves in October. Three small caves were visited. The first seen, Ramarau, is set in a cliff face and was used as a shelter in the Pacific war by the villagers. It was used to cook people killed in battle in the "tumbuna". Lines painted on the wall were said to represent warriors eaten there and there is cave art inside. Phil Johnson and Alan Olden joined Michael and Tim in a search for caves in the Rapitok and Gaulim areas in November. The sum total of a frustrating morning's searching for people and holes was a 6 m long tunnel.

Enga Province. The Mink River stopped flowing leaving a completely dry, exposed river bed on 20th October, according to the Post-Courier of 5th November. It is highly likely that the river is in karst country and has gone underground.

Muller Range Expedition. This year's expedition concentrated on the impressive Atea Kanada (see report p139). Some 4-5 km of passage were surveyed and plans are already under way for a large international trip in '78 to push the Atea. Following the expedition some University of Technology staff members complained that the members had explored the cave against the wishes of the local villagers. This has been denied by Kevan Wilde. The Director of Cultural Affairs, Mr. John Haugie, appeared on a NBC Contact programme following the complaint and stated that overseas cavers may have to be prevented from coming to P.N.G. to explore caves if they do not respect the wishes of the cave owners.

New Ireland. Members of the '76 expedition to the Lelet Plateau explored a number of caves on the coast and the high plateau, the deepest being about 112 m (see report p141). Hal Gallasch visited some previously unreported burial caves at Ramat Village near Namatanai in October. Jim Farnworth has been living on New Ireland lately and he and Hal had a look at Kameribuk, one of the rainmaker's caves", in the same month. Jim has also visited Danmin and the burial caves at Lemeris.

At the request of the Scientific Advisory Committee to the National Parks Board, Michael Bourke prepared a detailed submission on the suitability of the Lelet Plateau for a national park. It was recommended that the Plateau may be suitable, principally because of the karst types. It is unlikely that the proposal will be followed further at this stage because of staff shortages in the N.P.B. From Nigeria Petar Beron writes that one of the beetles he collected in New Ireland caves has been identified as a new species and both species of shrimps he collected in Danmin are new ones.

North Solomons Province (formerly Bougainville). Hans Meier did a flight over the Keriaka Plateau in June and saw a number of the large dolines there. Michael Kiap and Hans did two trips in August out to Taroku, a previously unreported river cave near Urumovi Village. Things are looking up in the "ailan bilong san kamap" lately as there are now a number of caving areas within easy reach and sufficient keen bods. An informal group called the North Solomons Cave Exploration Group has been started and they are putting out a newsletter.

Peter Corbett and Hans went out to the Urumovi area in October and got into a further two caves, one of which is said to be the upper end of Taroku. For the November trip William Asigau, Harry Rehtla and Asigau Tau joined Hans and the party investigated two effluxes and were able to enter a cave a short distance at one of them. Later in November Malcolm Pound, Hans and Harry returned to Taroku with Lawrence Sirapui and John Birepai and pushed the cave to the limit. They surveyed the cave and recorded a passage length of 771 m. The councillor at Urumovi has requested Hans to approach the provincial government to obtain permission for trips to the new area.

Solomon Islands. A group of seven from the N.S.W. Institute of Technology Speleological Society led by John Weir made a brief trip to the Solomon Islands in June-July to look at the potential of two limestone areas. On Guadalcanal, just inland from the capital Honiara, two river caves were located and surveyed. Many more river caves are believed to exist further inland, but limited time did not permit searching in these areas. A small portion of the north-east coastal limestone belt was investigated near Buala on Santa Isabel. A fault-controlled vertical cave was found near Kolokofa Village, about 9 km inland from Buala. A comprehensive report is to be published in the NSWITSS newsletter.

West Sepik Province. In October Kev Wilde came across a rock art site at Mianmin in the headwaters of the May River. It is in a sandstone rockshelter. Kevan has surveyed and recorded the art and prepared an article on it. He says that the shelter in the Frieda River area is in conglomerates not agglomerates as he previously reported (The Caving Scene N.C.4(1)).

R.M.B.

PAPUA NEW GUINEA KARST TYPES. 6. DOLINE KARST

E. Löffler *

Doline karst occurs over virtually the whole altitudinal range in Papua New Guinea. The lowest occurrence has been observed by the author in the south-eastern part of the Fly Platform some 30 km north of Mabaduan at an altitude of less than 10 m. Here the nearly flat alluvial plain is densely pitted with numerous shallow saucer shaped depressions swampy or filled with water about 40-60 m in diameter. The alluvium is underlain by limestone at a depth of about 1 m. The depressions represent dolines which have been sealed off by the alluvium and which must have developed when the limestone was exposed to the atmosphere. The dolines appear to be all inactive and the whole plain is under water during most of the wet season.

Doline karst near sea level has also been reported from the Trobriand Islands by Ollier (1975). The largest concentration of dolines, however, is to be found at higher altitudes. They are particularly prominent on the summit plateaux of the Muller and Saruwaged Ranges but are distinctly different in appearance. While on the Muller Plateau the dolines are more like large bomb craters with diameters of the order of 100-300 m and more, with nearly vertical side walls (Photo 1, 2), on the Saruwaged Plateau the dolines are much smaller, generally saucers shaped, and resemble closely the dolines found in karst areas of the temperate zones (Photo 3, 4). The Muller Plateau dolines appear to be formed largely by collapse due to a very active underground drainage system, also indicated by the frequent occurrence of dry valleys and large underground rivers rising from the edge of the plateau with large discharges of water. According to the Papua New Guinea Speleological Expedition (1974) a great number of these dolines are developed in calcareous siltstone which overlies purer limestone. The more active solution processes in the purer limestone lead to undermining, formation of cavities and eventual collapse of the siltstone forming the roof.

The Saruwaged Range is like the Muller Range - essentially a structural plateau formed on horizontal to subhorizontal sheets of limestone. However, no calcareous siltstone is present here. The largely detrital Miocene limestone is massive, well bedded and over 1000 m thick and forms a spectacular cliff to the south towards the Markham graben. The plateau surface is much more irregular and rounded hills rise some 300 m above the general plateau level. In the highest part around Mt. Bangeta the relief has been accentuated by glacial erosion (Photo 3).

Dolines occur over the entire plateau but are most common along drainage lines (Photo 4). They also appear to be more common in grassland areas than under forest but this is probably due to the fact that they can not be readily identified under a dense forest cover.

The majority of dolines observed in the field are relatively shallow saucer shaped solution dolines (Photos 3, 4). However, near the edge of the plateau some very deep (more than 40 m) collapse dolines are developed.

* CSIRO Division of Land Use Research, P.O. Box 1066, Canberra City, A.C.T. 2601. Australia.

Solution dolines at similar altitudes and of similar appearance have been reported by Verstappen (1964) and Shephard (Unpublished 1965) from the Star Mountains. The predominance of doline karst in high altitudes and the virtual absence of other more tropical karst types has led to suggestions that tropical karst landforms are replaced by temperate karst in these high altitudes, possibly due to reduction in the rate solution processes with decreasing temperatures (Jennings and Bik, 1962; Williams, 1973). The presence of doline karst close to sea level does not invalidate this assumption, however, a gradual change from a tropical karst type to a doline karst with increasing altitude has not been observed and it may well be that lithological conditions such as relative purity of the limestone are of greater importance than climate.

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Photo 1. Apia Sink a collapse doline on the Muller Range. Dry valley to the left. (Photo by author).

Photo 2. Surface of Muller Range pitted with collapse dolines formed on calcareous siltstone which overlies purer limestone.

Photo 3. Saruwaged Range with shallow saucer shaped solution dolines on floor of glacial basin (foreground) and Mt. Bangeta (4121 m) third highest peak of Papua New Guinea. (Photo by author).

Photo 4. Plateau surface of eastern Saruwaged Range with numerous small solution dolines preferentially along drainage lines.

* * *

THE NEW CONTRIBUTOR

John Weir is a member of the N.S.W. Institute of Technology Speleological Society. In 1974 he did some caving on Santa Isabel and San Cristobal Islands whilst working in the Solomon Islands. He recently led a trip to Guadalcanal and Santa Isabel Islands.

* * *

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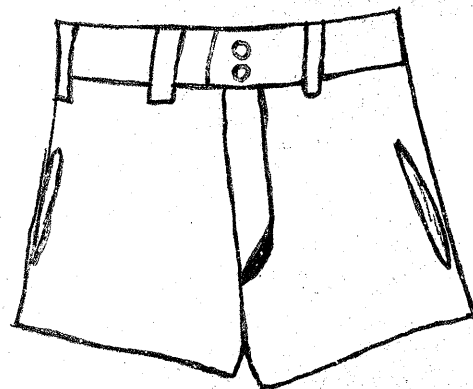
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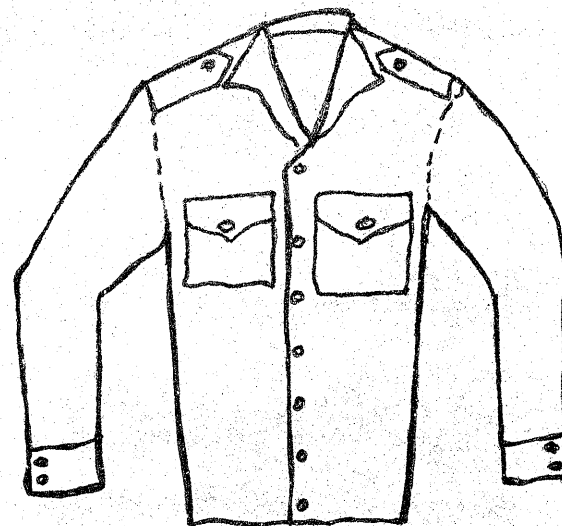
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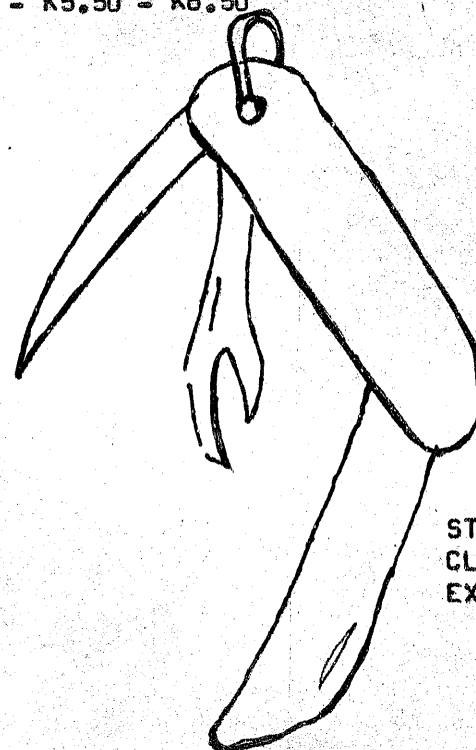


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SOME ROCK ART, ANCESTRAL AND PREHISTORIC SITES OF THE HINDENBURG RANGES AND TIFALMIN AREAS OF THE TELEFOMIN SUB-PROVINCE: WITH BRIEF NOTES RELATING TO ASSOCIATED LEGENDS AND MYTHOLOGY

Kevan A. Wilde *

The following report describes a number of rock art, ancestral and pre-historic sites along the Hindenburg Ranges and in the Upper Tifalmin Valley. The sites were visited and recorded by the author and members of New Guinea '75 - British Speleological Expedition to Papua New Guinea between March and November, 1975. The rock art is described in some detail whilst the material relating to areas of ancestral or prehistoric interest appear in note form. This is the first record of these sites, aside from Wilde (1975b), and there has been no archaeological research carried out within the area dealt with in this report. Brief mention is made of myths and legends associated with some of the more significant caves.

The sites are listed from east to west and cover an area from the most easterly portion of the Hindenburg Wall to Telefomin itself. (Exact locations have been made available to the Niugini Archaeological Survey, Department of Anthropology and Sociology, U.P.N.G., but are not included here in the interests of conservation.) The area dealt with (again from east to west) is inhabited or exploited by the Wopkeimin, Tifalmin, Urapmin and Faiwolmin groups of the Mountain Ok or Min people. A more complete paper will appear in the New Guinea '75 Expedition report.

DESCRIPTION OF SITES

1. Selminum Tém (Upper cave) (CEQ)¹

As this is a very significant site it is proposed that it be dealt with in some detail (see cave survey and Figure I A and B).

Approximately 40 km west of Telefomin and 15 km west-south-west of Bufulmin (Tifalmin), nearest village Amanabip; and 10 km north-east of Bultem (Wopkeimin). Elevation approximately 2500 m (est). This site has two areas of interest; a large mainly dry cave and an overhanging, smoke blackened cliff face (see cave survey which shows the first 250 m of a 14 km system) which are located in a relatively large doline some 2 km south-west of the main Finim Tel clearing (see Wilde, 1975a). The two most obvious features of this site are two man-made pits (Figure I A) both located in the zone of permanent darkness and remaining a complete enigma. The pits appear to be ancient (?) and may have been used for storage pits (?) or traps (?); or, what seems most likely, they may have had a magico-spiritual function (?).

Although there were no hearths observed within the interior of the cave there are remains of burnt wood and "bombom" torches. The entrance area is comparatively dry with very little current deposition taking place and the soil

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¹ National Site Survey Code, U.P.N.G.

profile appears to be dry and deep. The overhanging, smoke blackened cliff face to the south is dry and appears to be well used. The writer was informed that the cave featured strongly in the local mythology (see Legends and Mythology) and that the cliff face could be used as a cooking and sleeping place whilst hunting, but the cave itself was prohibited.

2. Selminum Tém (Lower) (CER)

Site 1 and 2 are actually connected by very constricted passage and are a part of the largest cave "discovered" by the expedition (Wilde, 1976a). The fact that expedition members were not the first humans to enter the cave was a surprise to many. There is, however, substantial evidence of intensive use and penetration up to a distance of 150 m past the zone of permanent darkness, but local informants say that they do not enter the cave because of harmful spirits. (No objections were made to our entering it.)

The points of interest have been listed below and can be related to the cave survey.

(1) An engraved bird, said by local people to be a "kawel" (hornbill), scratched into soft, weathered calcium on a large, upright slab of limestone (see cover photograph) and following the natural cracks and morphology of the rock surface. A number of parallel scratched lines occur on the adjacent slab.

(2) Incised horizontal and parallel lines.

(3) Engraved lines of no apparent form to the writer.

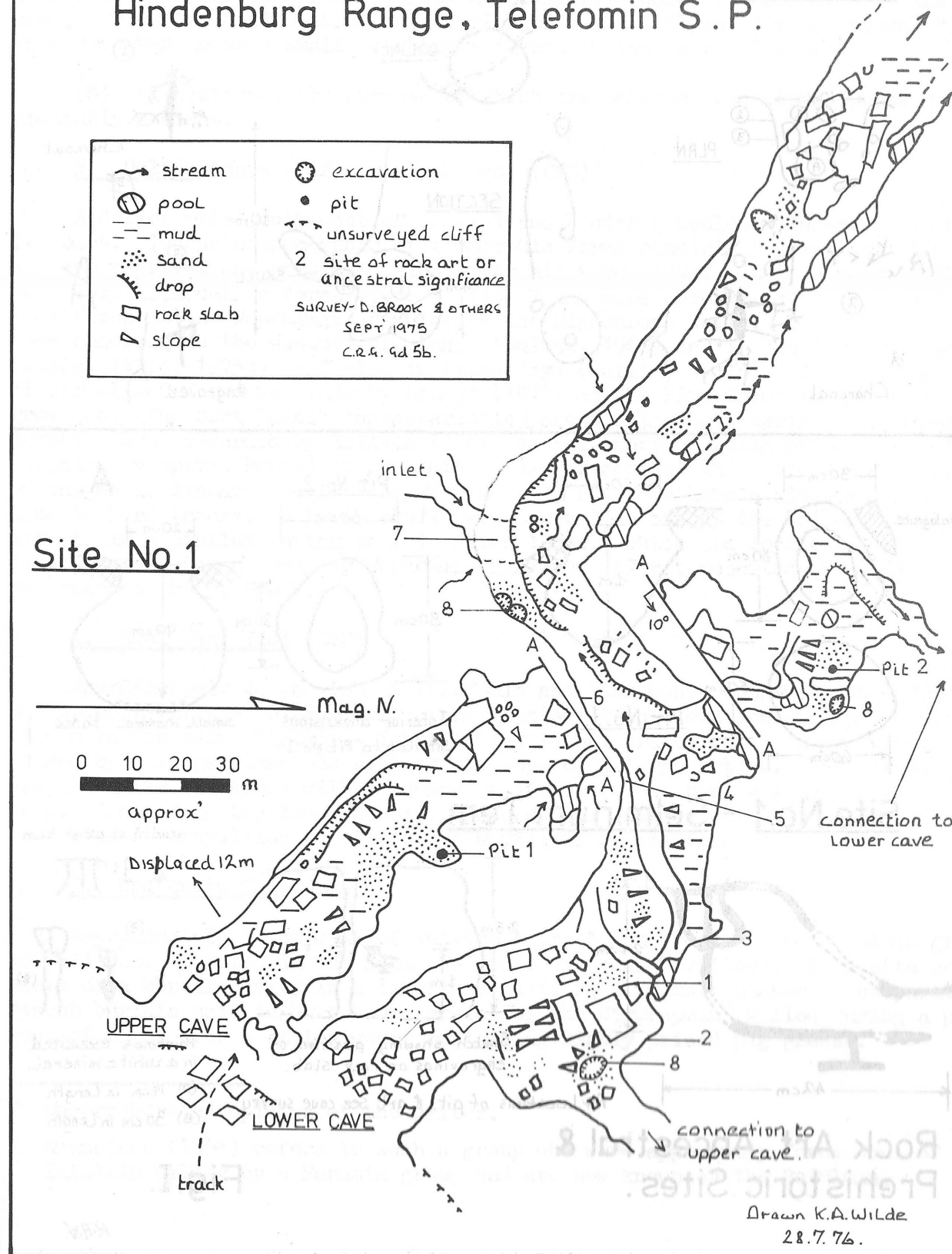
(4) Faded, almost indistinguishable and enigmatic motifs executed in an unknown white mineral (possibly weathered limestone). The faded appearance and the protected nature of the paintings give the impression of antiquity.

(5) Two further paintings also executed in a white mineral: (A) a vulva² (?) with a filled-in plectrum shaped form below followed by two small filled-in elliptical forms - less than 0.5 m above current floor level; (B) a form of no apparent meaning to the writer but possibly phallic, and similar to (A).

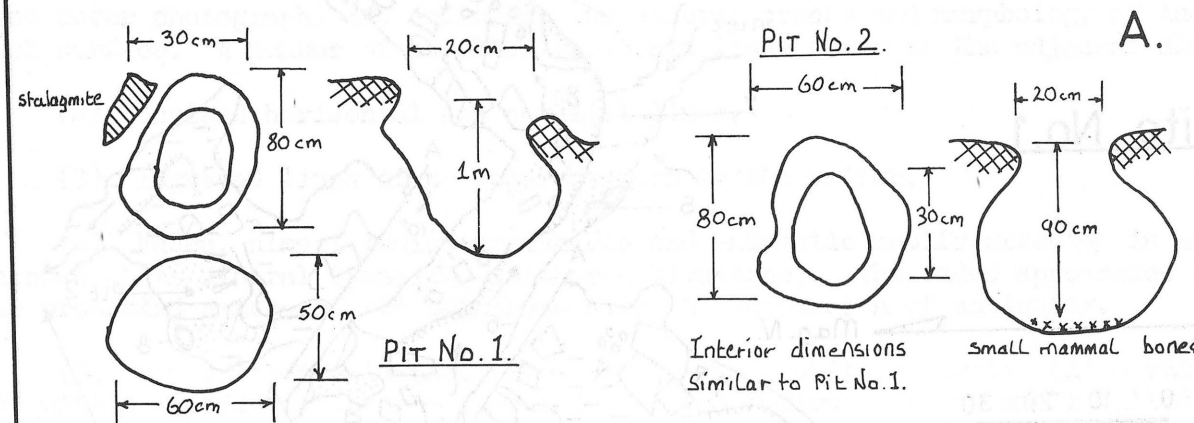
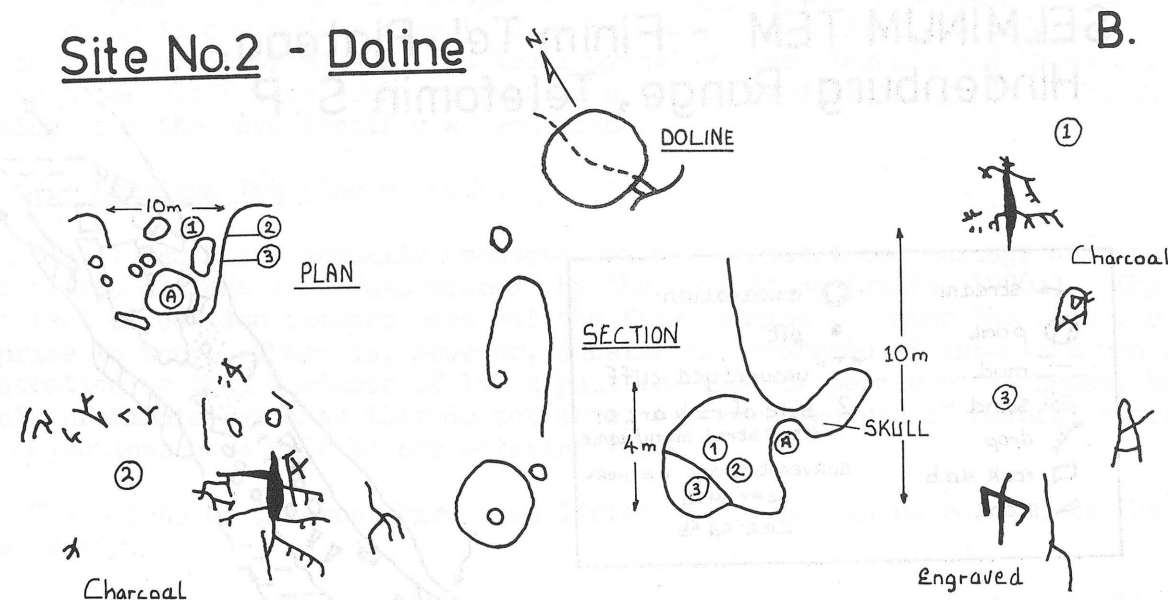
(6) Two extremely faded paintings of possible anthropomorphic form and executed in a white mineral (as above). These figures are very difficult to distinguish and accordingly have not been photographed or copied. The lower figure which is approximately 4 m above floor level appears to have bent upraised "arms", and an open circular "head" with radiating lines surrounding it, and a filled-in rectangular and elongated "body"; no "legs" are visible. The second figure is 1 m above and to the left of the first; and consists of a "stick-like" linear form with an open circular "head" and outstretched linear "arms" and "legs". The "body" is also linear, open and elliptical in shape with a stylized penis. Both these forms are located beneath an area of calcium carrying water. It is interesting to note that both figures are similar to others observed at the Aibura site in the Eastern Highlands Province (Wilde, 1975c).

² Uncorroborated opinions of the writer.

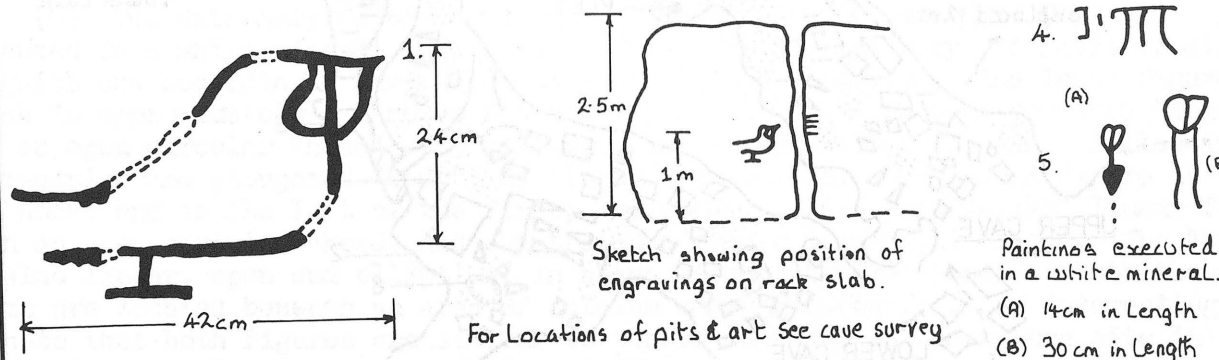
SELMINUM TÉM - Finim Tel Plateau, Hindenburg Range, Telefomin S.P.



Site No.2 - Doline



Site No.1 - Selminum Tém



Rock Art, Ancestral & Prehistoric Sites.

Fig.I.

R.A.W.

(7) Charcoal and decomposed wooden material, and "bombom" torches, and chert flakes that may be the product of tool-making (?) were also observed in the same area. Dried and unidentified faeces alongside small flying fox and mammal bones were observed under a small overhang adjacent to the chert flakes.

(8) Excavations, the purpose of which are unknown, but appear to be considerably ancient.

3. Doline (Name - if any - unknown) (CFC)

A doline site south-west of Sites 1 and 2 with a boulder cluster located in its base. Two anthropomorphic or zoomorphic forms possibly representing lizards and one engraved and possible anthropomorphic form occur. It is interesting to note that lizard-like forms occur at Site 7 and were observed by Craig (1968) on rock faces in the Wopkeimin area (below the Hindenburg Wall). They have also been observed in the Western Highlands (Bulmer, 1966) and in the Eastern Highlands (Wilde, 1975c; 1975d) and also in Irian Jaya (Gallis, 1957b). A recording of "lizard-like" forms was made by Bragge (1976) at the Piri Caves in the West Sepik Province. The bent "arms" characteristics are similar to a series of anthropomorphic forms recorded by Hallyer (1965) on the interior walls of the "amowk" (in Tifalmin = Spirit House) at Bufulmin. Also present at this site are a number of enigmatic linear designs (see Figure I B), but some have a similar appearance to bird tracks. A human skull was observed on one of the ledges. This site is in a similar environment to Sites 1 and 2 which are located in the lower montane forest used by Wopkeimin hunters. (First reported by T. White and recorded by D. Brook.)

4. Skel Waap Inal (CEP)

Approximately 24 km west of Telefomin and 5 km west-south-west of Bufulmin - the nearest village being Amanabip and located at an elevation of approximately 2000 m on the main Tifalmin - Tabubil traditional trade route. A rock shelter formed by a large limestone slab on the edge of a large doline. Well protected, dry and smoke blackened with evidence of intensive use over a long period of time. Located in the lower montane and used for shelter whilst hunting and gathering or travelling by either the Wopkeimin or Tifalmin groups.

5. Wok Dubim Tem (CEV)

Approximately 18 km west of Telefomin and 1.5 km west of the Bufulmin group of villages. Located in the inhabited zone of "kunai" valleys. This site consists of a burial cavity in a limestone cliff face, with a number of comparatively recent burials said to have been persons of the Winurapmin killed during a pre-contact fight over a stolen gourd containing highly prized pig grease.

2 Uncorroborated opinion of the writer.

3 Cranstone (1968) refers to such a group who were apparently forced out of the Tifalmin valley by a Feramin group and are now known as the Bufulmin.

6. Kenengkeneng Tem (CEW)

Approximately 18 km west of Telefomin and 1 km west of the Bufulmin Villages and consisting of a limestone overhang located in an identical environment to Site 5. A smoke blackened, overhanging wall with a dry earth floor located mainly behind the drip line. Two elongated, narrow and split river stones were observed at the site, and from their appearance could have been used as strikers or crushers (?); it seems that these stones were transported from the river for a specific purpose as no other similar stones were seen in situ in the geological sequences. A number of human bones had been placed on ledges and wedged into solution features.

Some art in the form of three red "diamond" motifs, one diagonally set "cross" motif and a linear charcoal design of no apparent form to the writer is present. It is of interest to note that White (1969) observed a diagonally set, red ochre "croix envelope" at the junction of the Tumbuda and Strickland Rivers. And red "diamond" motifs have been observed in the Chimbu area of the Eastern Highlands (Bulmer, 1960). "Cross" motifs have also been observed at Kainantu in the Eastern Highlands (Wilde, 1974), in the Western Highlands (Bulmer, 1966), and by Gallis (1957a) in Irian Jaya.

7. At Tem Luun Tem (GET)

See Site No. 2, Wilde (1975b).

Concentric circles and "cross" motifs executed in yellow, red and white clays or ochre occur at a rock shelter on a cliff face at Inikia De Bom 12 km west-north-west of the Frieda River copper prospect (Wilde, 1976c).

8. Name Unknown (CES)

See Site No. 1, Wilde (1975b).

9. Bal Kurinon or Bal Kuun Luun Tem (CEU)

See Site No. 3, Wilde (1975b).

10. Agim Imal (CFD)

A small damp fissure or rock shelter near Agim Tem (Wilde, 1975a p117) used for sleeping and cooking whilst hunting "sagaam" (flying fox). Probably unsuitable for archaeological excavation (?) due to dampness and its little used appearance.

11. Karimuk Imal (CEX)

See Site No. 4, Wilde (1975b).

12. Dabandu Imal (CFA)

Approximately 12 km west of Telefomin and a short distance from the Malakaamin garden area; this site consists of a rock shelter located in the base of a collapsed

sink-hole with smoke blackened walls and a number of currently used hearths. Situated at an elevation of approximately 2000 m in the lower montane forest and used by the Tifalmin-Urapmin groups as a base for hunting.

13. Mokfuma Imal (CFB)

Approximately 1 km north-east of Site 12. A rock shelter located along a limestone cliff face in a valley floor - smoke blackened and well used with a number of currently used hearths. Environmentally similar to Site 12.

14. Borem Imal (CEY)

See Site No. 5, Wilde (1975b).

15. Kuruku Neng Imal (CEZ)

See Site No. 6, Wilde (1975b).

16. Langlang Imal (CFE)

A reported, but unvisited, rock shelter 2 km east of Site 15.

17. Miben Tem (CFF)

Approximately 10 km south-south-west of Telefomin and consisting of a large resurgence cave that flows into the Ok Ket. A number of bones calcified into a ledge in an open collapsed feature between two parts of the same system (reported by A. Golbourne). Located at an elevation of approximately 1500 m near an old and abandoned garden area. The bones are said to be those of persons from a clan known as the Alkelmin, who by legend are said to have been destroyed by sorcery. A short distance west of this site is an old abandoned village area which according to informants was inhabited by the Alkelmin.

DISCUSSION

There can be no doubt that the area supports a large number of sites that are suitable for archaeological investigation. A number of other sites apart from those reported here are said to exist, but were not visited by the expedition. It is the opinion of the writer that many other rock art sites are to be found within the area dealt with in this report, but are either unknown to the people (as with Selminum Tem (Lower)), or more likely, are considered to be "amemtem" (prohibited caves). It is also the writer's opinion that it is unlikely that such relatively advanced and involved art forms could exist at so few a number of sites, and that such a developed level of parietal art could not have been attained without more intensive activity. More exploration and further studies are obviously required before any positive conclusions can be drawn.

Craig (1968) noted a number of parietal art sites among the Wopkeimin and Atbalmin and he states that the art forms normally occur in charcoal, but ochre paintings were also observed. This conforms with the writer's observations, but Craig also states that charcoal and ochre drawings occur on rock surfaces,

usually shelters - never caves, which is inconsistent with the writer's observations: Selminum Tem (Wopkeimin) and At Tem Luun Tem (Bufulmin) are both cave sites. It is interesting to note that Craig's informants placed no magico-spiritual significance upon the paintings and drawings observed by him. The paintings and engravings found in Selminum Tem feature in the local mythology (see Legends and Mythology) and are obviously significant. However the Tifalmin people seemed to place no such value on the rock art sites in their valley. In all cases it was stated that the art had its origins beyond living memory.

Craig (1968) also recorded a number of bark wall paintings amongst the Wopkeimin and Atbalmin which are very similar to those recorded at Bufulmin by Hayllar (1965). Craig postulates a "tendency towards dynamic representation" and a possible correlation with hunting and food gathering economies with a "mental outlook based on magic which seeks to obtain results through action ...". But, as mentioned above, his informants denied any magico-spiritual significance. They also informed him that the act of drawing and painting was a form of entertainment and a means of passing the time. But, it is the opinion of the writer that there are several categories of such art within such a society: this opinion is based on the consistency with design elements in adjacent areas, and the significance of some of the locations such as inside the "amowk" (spirit house) at Bufulmin and on the walls of a cave, and well within the zone of permanent darkness, such as Selminum Tem. Furthermore the fact that the art is associated often with burials is indicative of magico-spiritual significance rather than an art for art's sake attitude or that the artist was merely passing away time.

Several references have been made to similar rock art forms and styles, in this report and the preliminary report by Wilde (1975b), and comparisons have been made with rock art throughout other areas of Papua New Guinea and Irian Jaya, but because of the limited amount of material available, no proper attempt can be made at correlating the styles and materials or geographical distribution. Probably the most significant factor to date is the consistency of the occurrence of "lizard-like" forms throughout the Eastern and Western Highlands, West Sepik and parts of Irian Jaya.

LEGENDS AND MYTHOLOGY

An unusual factor of the "min" is their claim to a common genesis and almost universal belief in Afek⁴, an ancestral heroine of great importance (Quinlivan, 1954). Apart from laying the basis of law and custom she was responsible for the creation of the spirit houses and associated cults. In order to do this she had to travel long distances and it is said that on many occasions she chose to travel beneath the ground, and according to legend it was in this manner that many caves were created (Wilde, 1976b): Selminum Tem is such a cave. Some of these caves she designated to be the domain of spirits, prohibited access to them, and they are known as "amentem" (literally: prohibited hole). Any future expeditions should respect these "tambu" caves and permission for access should not be expected and the wishes of the people respected at all times.

4 The mythology surrounding Afek is secret cult information and should not be openly discussed with non-initiates.

Afek is also held to be responsible for the creation of underground routes designed to serve as access to "Bagelam", the place of the dead, and the sacred holes/caves known as "amentem" serve as entrances to the "road of the dead" (D. Jorgenson pers. comm). It is also believed that the souls of the dead manifest themselves in the form of flying foxes and inhabit caves even though flying foxes are hunted and eaten for food. Apart from the Afek myth, there are others that refer to spirits occupying caves (see Wilde, 1975b), and the fact that the Faiwolmin believe that their ancestors emerged from a karst feature on the ranges (Barth, 1971), is all strong evidence as to the cultural significance of caves and karst features in the Telefomin area.

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* * *

CAVES OF NEW CALEDONIA AND THE NEW HEBRIDES

R. Michael Bourke *

NEW CALEDONIA

The large island of New Caledonia and smaller associated islands are located some 1600 km east of the Central Queensland coast and to the north of the Tropic of Capricorn. The climate and vegetation is sub-tropical. The original inhabitants are Melanesians but people of European descent are now almost as numerous as the Melanesians with smaller Polynesian, Indonesian and Vietnamese communities.

Limestone is not particularly prominent on New Caledonia itself, but the islands have attracted the attention of European cave explorers for some time. There are a number of French cavers in Noumea, the islands' capital, although they are no longer very active. They do not seem to have produced much literature aside from a short report in 1961 or 1962 in a French publication. There have been three Australian expeditions to New Caledonia. The first was in 1962-63 when three Sydney cavers spent several months there and visited five areas (Hayllar et al., 1965; Hamilton-Smith, 1965). In 1965-66 a 10 man party from Australia visited the islands (Moore, 1966). They mapped the Grottes D'Adio and visited other areas together with four local cavers, but published no report. In 1974-75 a seven member party from Queensland and Tasmania mounted another expedition and have produced a comprehensive report (in press). I spent two weeks in New Caledonia and the New Hebrides in July-August, 1976 and visited two cave areas in New Caledonia. The main caving areas are as follows:

Poya area. Some 14 km by road inland from the township of Poya lies the most famous cave of New Caledonia. It is known locally as Grottes D'Adio (the cave at Adio) although I was told by the local chief that the native name is Kaluirer (phon. Kalu:ira) in the Ajie language.

The cave is justifiably famous. There are at least two entrances. It has three levels and may be 8 km long. I followed the river passage for 1500 m or so without reaching the end. My exploration was stopped by a number of deep pools at which I baulked as I was on my own. The cave has a "classical" form and it is easy to see why it is so famous locally. There are complex passages near the entrance where one could easily become lost (and some visitors have). The stream passage continues on and on. It is well decorated with flowstone and bats are numerous in places. Kaluirer is located near the base of one of four impressive limestone towers. There is a Youth Hostel ("Auberges de Jeunesse") hut at the entrance and it is a very picturesque campsite.

Meareu-Nindhia. Some 5 km west of Houailou (pronounced Woilu) on the north-east coast there is a catholic mission at Meareu-Nindhia. A number of limestone outcrops occur south of the mission and in at least one of these small caves occur. These were used as burial sites in past times and human bones can be found inside the caves and small crevices. The outcrops here, and those at Adio, are quite similar to those in northern Australia such as Mount Etna and Chillagoe in Queensland. The limestone is deeply fluted although it is perhaps not quite as sharp as the Queensland outcrops. Even the vegetation of fig trees and vine

* D.P.I., Keravat, E.N.B., P.N.G.

scrub is reminiscent of that on the Queensland outcrops.

Other areas. Caves occur at a number of other locations, but I did not have time to visit these. There is a limestone plateau inland from Koumac on the southwest coast. Caves up to 500 m long are known from here. Gèze (1963) describes a cave he followed for 430 m to where he encountered a deep pool.

Hayllar *et al.* (1965) reported a large cave at Ouaoûé, 15 km south-east of Bourail. Sanborn (1950) refers to caves at Nepoui (north of Poya), and Boupouparis, both on the south-west coast, but provides no details. Inland from Hienghène, tower karst and caves occur. There is a tidal cave about 18 m deep and 9 m high near here (Sanborn, 1950).

The Loyalty Islands and the Isle of Pines consist of raised coral. Tourist caves are reported on the Isle of Pines. Hayllar *et al.* (1965) give a report of caves on Lifou Island including burial caves that they explored. A cave legend from Lifou was recently published (Anon, 1975).

Discussion. New Caledonia is an interesting place to visit, although it is quite overrated as a tourist destination and is unbelievably expensive. I doubt if it is worth another major overseas expedition given the potential of other Pacific islands, especially P.N.G. However the caves make it worthwhile for a smaller group, particularly if they were to concentrate on one or two of the lesser known areas, such as Koumac, and thoroughly explore these.

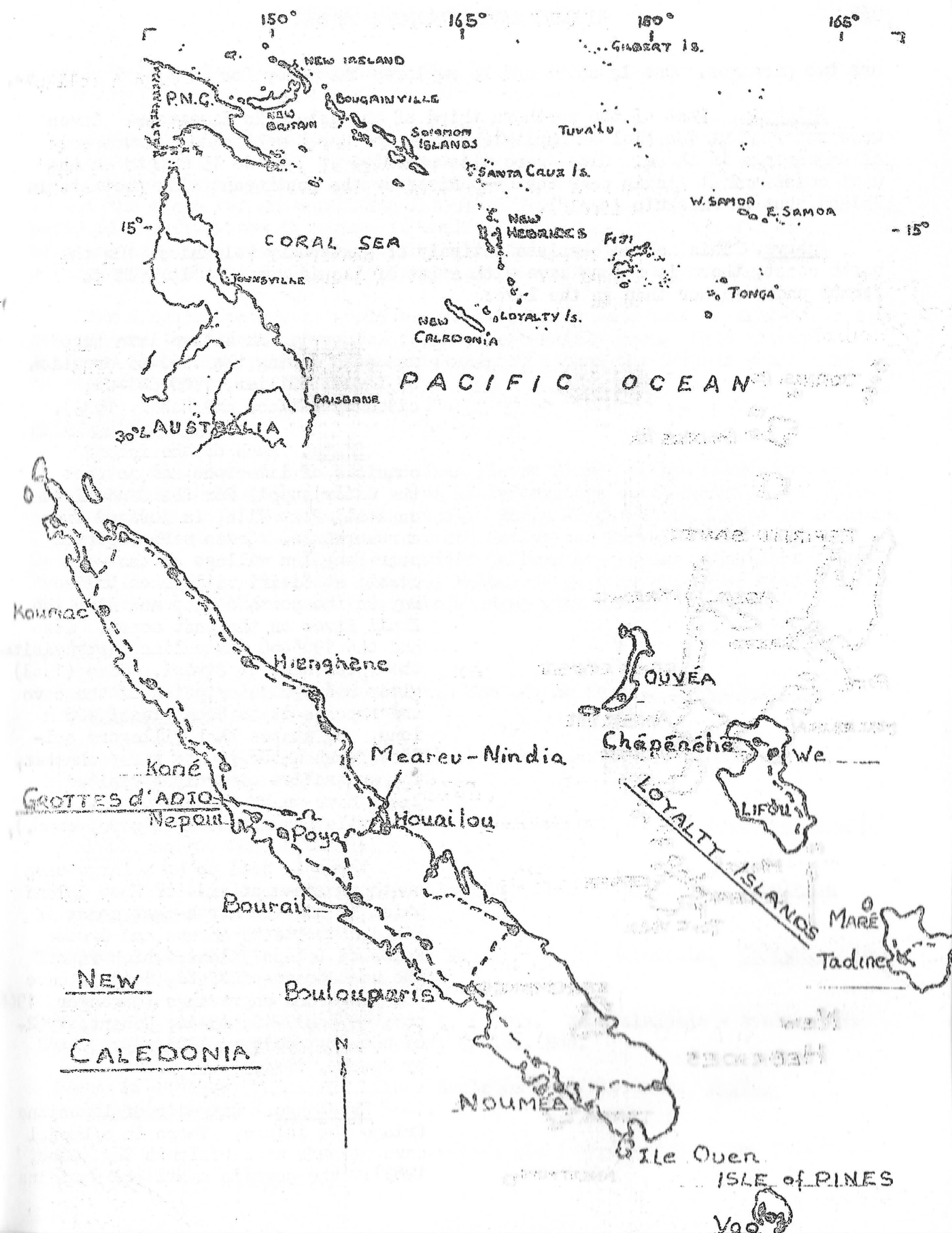
NEW HEBRIDES

The New Hebrides Condominium consist of a long chain of islands that run almost north-south. They are north of New Caledonia and some 2000 km east of the north Queensland coastline. The native people and the climate are similar to those of P.N.G. France and Great Britain (!) administer the islands, although independence is on the way. Quaternary limestone is prominent on a number of islands and occurs on almost all of them. The islands are quite recent geologically and tertiary age limestone only appears on Espiritu Santo.

I did not meet or hear of active cavers there. Caves on Efate and Espiritu Santo were visited by members of the 1965-66 Australian expedition that visited New Caledonia. There are a few incidental references to caves in the literature. I was unable to do any caving during my stay there, mainly because of transport problems. Notes on reported caves are as follows:

Espiritu Santo. This is the largest island in the group and the administrative centre is Santo. The eastern half consists of raised reef limestones as do the smaller islands off the eastern and southern sides. Miocene limestone occurs in nine locations on the western half according to the 1975 geological map. Access to these areas would be difficult. Sanborn (1950) refers to caves at Segond Channel (east of Santo) and at Hog Harbour, but he gives no details. The Australian party visited a series of caves on the northern side of Aore, an island south of Santo (Hamilton-Smith pers. comm.).

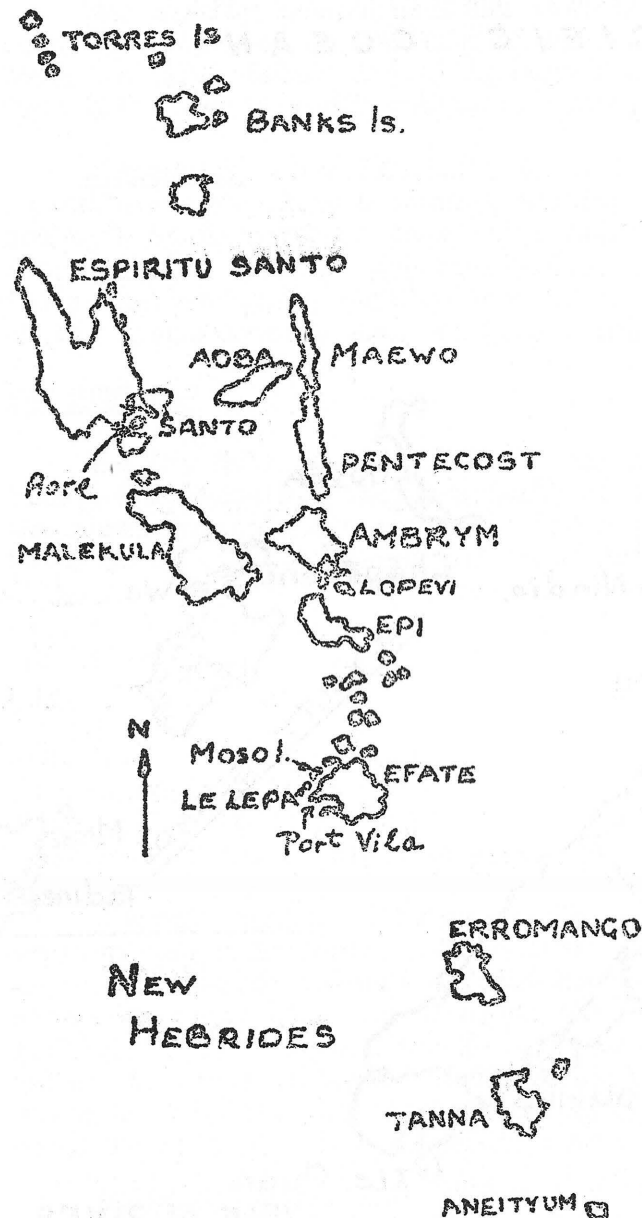
Maewo and Pentecost. About half of Maewo and most of Pentecost are limestone. Gèze (1963) describes a lava cave on the west coast of Maewo. There



are two passages. One is short and he explored the other for 50 m to a collapse.

Malekulu. Most of the northern third of the island is limestone. Caves were reported at Ten Miel on Espiegle Bay on the north-west side. I was told of engravings in these. Caves were also reported at Isle de la Grotte on the west coast and at Atchin near the Orap River on the north-east side (not Atchin Island, but on Malekulu itself).

Ambrym. This island consists entirely of quaternary volcanics. On the north coast, there is a long cave with a lot of liquid guano it. It is formed under rather than in the lava.



Lopevi. An active lava tube was seen during the 1963-65 eruption of Lopevi (Ollier, 1969 p61-62, cited by Wallace and Hebda, 1974).

Efate. Much of the island consists of limestone and in fact the water supply for the Condominium capital, Port Vila, is derived from a resurgence. Caves were reported near Mongalau village on the west coast; at Siviri village on Uadine Bay on the north coast; and near the Ebuli River on the east coast. Gèze and the 1965-66 Australian party visited the river cave at Siviri. Gèze (1963) gives a brief description of the cave and reports it to be at least 100 m long. He states that villagers collect fresh water in the first chamber. The Australian party also visited a large cave on Montmartre mission near Port Vila (Hamilton-Smith pers. comm.).

There is said to be a large cave on the north-west side of Moso Island which is off the north-west coast of Efate. Grotte de Markua and Grotte Feles on Lelepa Island, which is off the west coast of Efate, contain cave paintings and engravings (Garanger, 1966 p63; 1972 p39-40, 43-44; Hebert, 1962-65 p86-87; Speiser, 1923 p23. Cited by Specht, 1974.).

Erromango. Raised reef limestone fringe the island. There is a burial cave at Sufu near Dillon's Bay (Gèze, 1963). The cave is small and contains

skeletons of at least 200 persons. Gèze suggests that the skeletons date from epidemics following diseases introduced by European arrivals.

Discussion. Geological conditions do not appear favourable for the formation of very large caves. Nevertheless the impression from my brief reconnaissance is that caves may be reasonably numerous in the islands. The New Hebrides is not the place for an expedition intent on new records, but for a small caving party with a few weeks to spare, it could be rewarding. The islands are attractive and have many similarities with the smaller islands in P.N.G. Pidgin is widely spoken whilst English and French are the official languages.

For a caving party, it would be worth spending some time on Efate as a road goes around the island and access is therefore fairly good. Both Malekulu and Espiritu Santo have promise although transport around the islands would have to be via workboat or canoe.

ACKNOWLEDGEMENTS

Dave Gillieson of Brisbane and Jean Pierre Sioret of New Caledonian Museum and Noumea Youth Hostel provided a lot of information about caves of New Caledonia which greatly facilitated my visit. Barry Wenghtman at Tagabe Agricultural School, staff at the Water Department and Geological Survey of the Condominium Government and various villagers provided information on cave locations in the New Hebrides. Elery Hamilton-Smith of Melbourne gave me a copy of Gèze's paper. The assistance of these people is acknowledged with thanks.

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LETTERS TO THE EDITOR

Scientific Society

The Council of the Papua New Guinea Scientific Society has requested me to thank you for the copies of the Niugini Caver and to compliment you on the fine standard of the journal. The Council hopes this excellent work will be maintained.

K. J. White, Secretary, Papua New Guinea Scientific Society, Port Moresby.

Fossil Find in Selminum Tem

Thank you for the copy and offprints of Niugini Caver Volume 4, Number 2. I was a little worried that the opening sentence may have given the impression that I was invited to Papua New Guinea by the British Speleological Expedition. In fact they had reported the fossil find to the Geological Survey in Port Moresby. It was through the generosity of the Geological Survey and the Ok Tedi Development Company that I was able to make a rapid trip to Port Moresby, then to Tabubil and subsequently to Selminum Tem to arrive just as the British Expedition was pulling out. I would be grateful if you could publish my acknowledgement of the support given by these two agencies in the recovery of the oldest recorded vertebrate remains from Papua New Guinea. On the completion of my current study of the specimens they are to be returned to Papua New Guinea.

Rod Wells, School of Biological Sciences, Flinders University, South Australia.

CIRCOLO SPELEOLOGICO ROMANO

We would be very interested to have your publication Niugini Caver; therefore we would like to know whether it could be received by us in exchange for our half-yearly one called Notiziario Del Circolo Speleologico Romano. By separate cover we are pleased to send you some recent issues of our publication.

Franco Pansecchi, Il Segretario, Circolo Speleologico Romano, Roma, Italy.

* * *

AN ANNOTATED SPELEOLOGICAL BIBLIOGRAPHY OF THE SOLOMON ISLANDS

R. Michael Bourke * and J. R. Weir **

Until recently there has been little interest in the caves of the Solomon Islands by outsiders. In view of the current interest, publication of a speleological bibliography seemed appropriate. No claim as to completeness is made, but this should give a start to persons interested in the islands. Most references to caves in the literature are incidental to other investigations. Caves are reported from 12 islands, including most of the major ones.

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Engravings in Fotoruma Cave, Poha River, Guadalcanal.

Allum, J.A.E. (1967). Regional Photogeological Interpretation of the British Solomon Islands Protectorate. Aerial Geophysical Surveys Project. UNSF-BSIP, 1965-68.
Interpretation of limestone and karst given; photo-geological maps for each island included.

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Areas of limestone outlined; karst plateaux mentioned; geological map shows limestone. Mt. Vasu Limestone is often cavernous.

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Four caves described from two areas on the east side of Shortland Island. Cave fauna discussed and map of one cave given.
- Spocht, J. (1975). Rock Art in the Western Pacific. Unpublished Manuscript.
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Three caves in the vicinity of Buala, Santa Isabel Island briefly described. Further caves seen in the Puepue River which enters the sea at Kira Kira, San Cristobal Island.

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DO YOU KNOW - that a hodag is a cave animal that has legs shorter on one side than on the other so that it can negotiate its hilly native terrain without walking elsewhere? They are well known in the U.S.A., but don't seem to have been reported from elsewhere.

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SPELEO PERSONALITY - MAL POUND

Having stated that M. D. stands for Malcolm David rather than medical doctor, and that M.D.P. was born in Melbourne in 1950, one can proceed to details of his profession. Which is that of Civil Engineer. In particular he has specialized in hydraulics and has an interest in karst engineering, this being a form of sanctioned cave destruction. He is employed in Port Moresby by a private engineering firm and maintains a healthy disrespect for public servants and other parasites. He went through the shop at the University of Queensland, and it was there that his caving career commenced.

His first trip with the University of Queensland Speleological Society (U.Q.S.S.) was to Kempsey in northern New South Wales at Easter, 1968. It was to be the start of many more. From then until he came to P.N.G. in January, 1975, Mal visited many areas in Queensland and N.S.W. As well as the regular areas, he specialized in minor areas such as Ashford in N.S.W., Wyberba (granite caves), Dorrigo, Noosa (sea caves), Raglan and Bracewell in Central Queensland and the not-so-minor Kempsey area. He visited many caves around Mole Creek in Tasmania at Christmas, 1971, whilst working in the area. He has also visited Australia's "longpela hol" - Exit in Tasmania and has caved at Jenolan and Yarrangobilly in N.S.W.

Since arriving in P.N.G. last year, Mal has got the Port Moresby caving scene underway again leading numerous trips to the Javarere caves beyond the Musgrave River. He was a member of the 1975 New Ireland Expedition and has also caved on New Britain and Bougainville.

Mal's engineering background comes out in his caving interests. He likes to develop, manufacture and write up such exotica as an "electronic slave unit" for flash guns as well as more conventional items like ladders. He has applied his hydraulic engineering to speleology with a study at Stockyard Creek at Kempsey. He is also an underground surveyor and photographer. Whilst competent using Single Rope Techniques, he is happier in horizontal systems, preferably when one can stand upright.

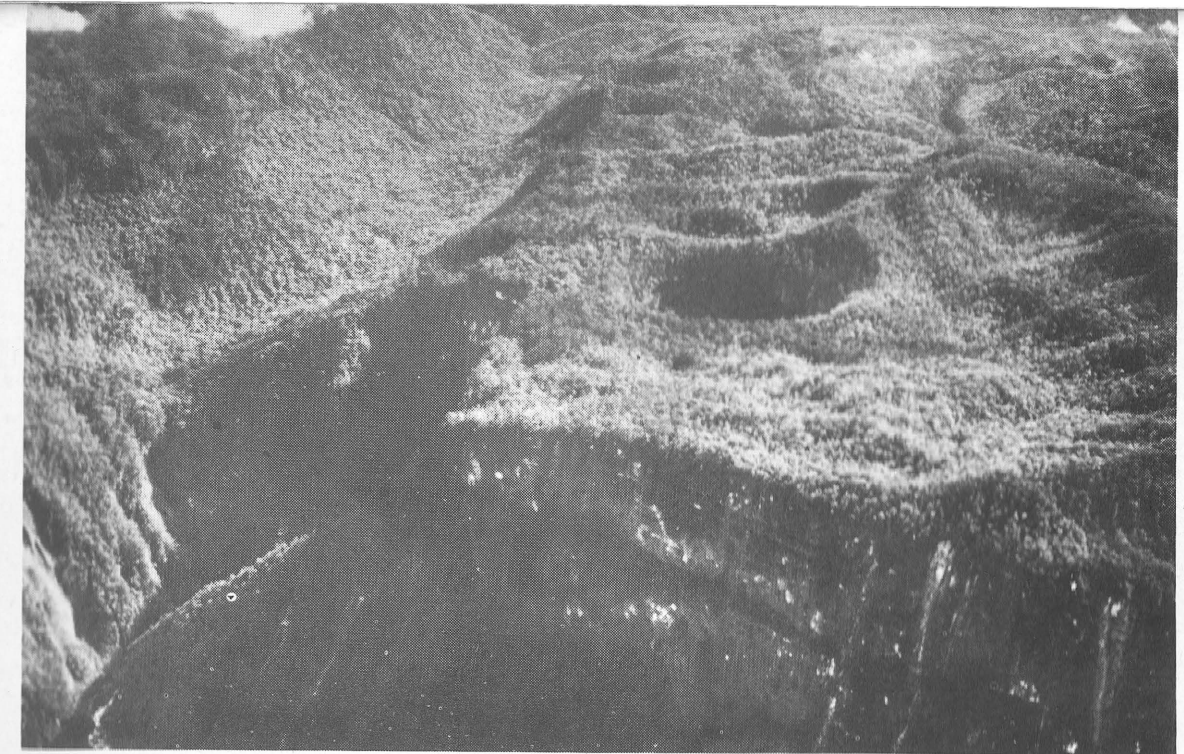
His abilities also extend to other aspects of caving. In the U.Q.S.S. in 1968-69 he held the position of "outings officer", the unfortunate fellow who organizes the caving trips. He was the Society librarian in 1972. In 1972 and 1973 he edited their magazine, Down Under. Under his stewardship, the newsletter improved in presentation. His editorial and literary abilities will be again put to the test next year when he takes over Niugini Caver.

Mal was married last February to a fellow Brisbane caver, Alison Burrows, an entomologist who will no doubt reform his bachelor ways. His characteristic mop of hair protruding precariously over his brow and his grin will be evident in P.N.G. caving circles for some time to come. Already Mal's contribution to speleology here indicates that he will be making his mark in P.N.G. as he did in his native Australia.

R.M.B.

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END OF VOLUME 4



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