AUSTRALIAN SPELEOLOGICAL FEDERATION
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SECTION 8
OVERSEAS RECONNAISSANCE

# PRELIMINARY SPELEOLOGICAL RECONNAISSANCE OF FIJI & TONGA

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## ABSTRACT

The literature on limestone deposits and caves of the Fiji and Tonga Islands is sparse, difficult to obtain and in general quite old. There appears to be nothing in the speleological literature. In January 1974, the author made a brief reconnaissance of some caves and karst in the South Pacific Islands. The best potential appears to be on Tongatapu and 'Eua Islands in Tonga, and in the Lau Group in Fiji, although small areas with good potential and relatively easy access are reported on Viti Levu.

## FIJI

The main islands of Fiji, Viti Levu and Vanua Levu are considerably older than most of the Pacific Islands, the earliest rocks being of mid-Eocene age, intruded by grandiorite dated as early as 54 million years.

Two types of cavernous limestone and dolomite deposits are found in Fiji:
1. localised deposits and small lenses up to a few square kilometres, ranging from Pliocene to Eocene in age, found on Viti Levu and Vanua Levu.
2. extensive quaternary reef and atoll limestones, sometimes froming thin crusts on thick bedded, older limestones, located mainly in the Lau and Yasawa Islands.

For logistical reasons, reconnaissance was restricted to Viti Levu, and descriptions of other areas have been obtained from the literature. Two major areas, Wailotua and Singatoka River Valley were investigated on Viti Levu.

1. Wailotua 178°24'30"E, 17°46'S "Caves" marked on geological map.

Situated about 70km north of Suva on Kings Road, Local villagers conduct visitors through caves by hurricane lamp for 50c. Active river system, at least 1500m long and chambers up to 80m high. Extensive guano deporits used for fertiliser. Good decoration. Excellent exploration prospects. Grade 2 map prepared. Resurgance of river examined 1km away, no entry possible. Very extensive limestone deposits marked on geological sheet a few kilometres north of Wailtoua, not investigated but map shows sinking streams.

2. Singatoka River Valley

A reconnaissance was made of all but one deporit reported between the coast at Singatoka and the village of Ndraimbe at the end of the road.

Singatoka: Tertiary and Quaternary limestones exposed along coast west and east of Singatoke. Several small closed depressions observed on side of Queens Road but local enquiries failed to locate any caves.

Lawai & Naroro: 177°32'E, 18°7'30"S. Not checked. Could be the location of the "Singatoka River Cave" mentioned by Sawyer & Andrews (1901).

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Mata-Ni-Vatu: 177°37'E, 17°59'S, 40km up valley road. Extensive but discontinuous outcrops, extensively faulted, several square km. Impressive dolomite (?) cliffs up to 350m high, unfortunately on opposite side of river were examined with binoculars and are spectacular. Residents at village of Rounitogo said that largest cave was a few hundred metres long but no serious attempts at exploration. Underground water and blind fish reported.

Tuvu: 177°42'E, 17°56'S. On west side of road 1.5km north of Tuvu. Village chief said caves used for burial and could not be entered but did lead to entrance. Not promising at all.

Yaloko Creek: 177°43'E, 17°54'S. Outcrop 1 km long examined by binoculars from road 0.5km away. Small cave reported locally.

Saweni: The Singatoke Valley road ends ar Ndraimbe where enquiries were made about deposits and caves upstream. Two caves are reported on side of Mt Talenalawe (177°48'E, 17°54'S) 2km east of Saweni village, bearing 104°Mag from end of road. One cave at river level, one on hillside, both easy walk through reported.

Korovou: 177°47'E, 17°55'S. Not examined. Maluwa Cave reported on Nasikawa Creek, said to be easy walk through.

Upper Singatoka Valley: Several long narrow lenses (?) are marked for at least 12km on west side of Singatoka River near Korolevu and Namoli villages. Caves reported, but reports were vague, near Mt Korovunima.

3. Vanua Levu (not examined)

Several mostly quite small outcrops are marked on the geological maps of the island. The most promising appear to be in the Upper Pliocene (?) Tuatua Limestone near Lambasa, and Ibbotson (1967) notes that "solution cavities are usually filled with limestone debris but there are a few extant caves which have been used as burial chambers" (p. 12). Access by air from Suva.

4. Lau Islands (not examined)

The Lau Islands lie some 250km east of Viti Levu, extending over a 500km length, and are accessible only by ship. Major cave systems are reported in the literature on the islands of Mango, Thithia, Lakemba, Nghillanghillah, Bai Vatu, Vatu Leile, Katavanga, Naitamba, Gamia, Tuvutha, Vanua Vatu, Yangasa and Yangava. Some of these are raised atolls and at Wangava a central tidal lagoon exists, completely shut off from the sea by high limestone cliffs on all sides. An active stream cave 500m long is reported on Mango, the surface of which is said to be virtually impassible because of the sharply fretted and deeply scoured limestone.

5. Yasawa Islands (not examined)

The only reported limestone is on Sawa-i-lau. Several large caves are known, including one entered underwater, and one of archaeological importance.

TONGA

Caves are reported on the main island of Tongatapu, and on Vava'u and 'Eua Islands.

Tongatapu: The island is a coral atoll 30km x 15km on which has been deposited volcanic debris from Vava'u to a variable depth averaging 10m. The island is therefore virtually flat, the heavy rainfall disappears quickly into the porous soil and there is apparently no surface drainage. A large cave near the village of Haveluliku , 20km from the capital of Nuku'alofa, is open to tourists and consists of a formed path along which visitors are conducted with torches or hurricane lanps. Opening from the back of attractive Anahulu Beach, the cave is

well decorated with stalactites, stalagmites and small helictites and, although only 50m from the sea there is a deep, slow moving body of fresh water inside. According to local guides, the cave can be followed, partly by swimming and wading, and partly by high level traverses, for approximately 8km to the village of Mua where it reportedly comes out underwater in the lagoon near the monument to Captain Cook. Now this sounds very much like the usual local exaggeration, however in the light of the origin of Tongatapu, caves of similar nature reported on Mango and Wangava in Fiji, the absence of surface drainage and the undoubted presence of a substantial fresh water lens, this is a lead well worth following.

Vava'u: About 300km NNE of Tongatapu, partly volcanic origin (Port of Refuge Harbour is an extinct caldera similar to Pago Pago). Tourist information folders describe tours to Swallows Cave on Kapa Island, a milticoloured chamber which is a sanctuary for thousands of swallows, and can be entered by boat. Tours are also available to Mariners Cave ... "guides take divers through the heart-shaped entrance into the mystical blue lit cavern". Not visited. Access by air or ship from Nuku'alofa.

'Eua: Access by scheduled light aircraft or ship from Nuku'alofa. This island consists of a low Late Tertiary coralline limestone fringing a more elevated backbone of Eocene foraminiferal limestone on a base of older volcanic rocks, and overlain in places by Miocene tuff. The author had only one day on 'Eua and in this short time traversed the shoreline for several kilometres north of Ohonua, and walked across part of the Central Valley. Local enquiries about caves were fruitless and in the Cantral Valley none of the "numerous shallow sinks" mentioned by Hoffmeister was seen.

According to Hoffmeister, the higher parts of this island contain large depressions. Some of these must be subjacent as they are described as being entirely in the Miocene tuff, and some contain water for short periods. Some of these depressions are said to be much deeper the others: Lister (1891) describes Ana Aha or Smoky Hole as being a funnel shaped shaft 30 x 13m in size and swallowing a stream which plunges straight down as a waterfall for about 60m. The top 2 metres is in volcanic material, the remainder in limestone, and "in all probability the bottom of the shaft represents the real volcanic basis of the island and the water of the stream follows along the limestone-volcanic contact through subterranean channels until it reaches the sea... the top of the shaft is about 550 feet above sea level" (Hoffmeister p. 21).

Another spectacular local feature (not visited) is the Matalanga, evidently a very large collapsed sea cave 80 metres deep.

'Eua is an absolutely splendid anachronism which will rapidly be spoilt following completion in 1974 of a dirt air strip. There are no cars, only one road, and a few trucks. Transport locally is by horse or foot, and there is a primitive but comfortable licensed lodge where horses and canoes can be hired. Details can be obtained from the proprietor, a New Zealander, who would no doubt be able to arrange exploration parties to the interior of the island: Mr Lance Collins, Taha-Kae-Afa Lodge, P.O. Box 12, Ohonua, 'Eua, Kingdom of Tonga.

Obviously a week at least would be required to explore the speleological potential of 'Eua, and if no worthwhile caves were found, it's a marvellous place for a holiday, at least until with the recent mainland air link, the tourists find it.

Selected References

Only those works referred to in the text are included here. The author has a more extensive bibliography which may be obtained by those interested.

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