

Sept 17, 81
HONO S-B



ready to deter aggression — their primary mission.

Louisell testified at a hearing called by the House Committee on Narcotics Abuse and Control, which released a survey on yesterday indicating that illegal drug use remains common among junior enlisted people in West Germany and Italy despite the military's anti-drug campaigns.

Louisell acknowledged that "our combat-readiness is affected" by drug abuse.

Rugby Canceled

ALBANY, N.Y. (AP) — Mayor Erastus Corning said today the Springboks rugby team from South Africa will not be allowed to perform at the municipal stadium next week as planned.

The statement by Corning came shortly after Gov. Hugh Carey said the game should not go on next Tuesday because of the danger of violent disruptions involving opponents and supporters of South Africa's policy of racial apartheid.

The decision followed published reports that state police had learned Ku Klux Klan members from Connecticut and Communist Workers Party members from New York City were mobilizing for what they said could be a violent confrontation.

Tuvalu Election

SUVA, Fiji (AP) — Dr. Tomasi Puspua, 42, defeated incumbent Toalipi Lauti to become prime minister of Tuvalu, a small western Pacific state of nine atolls, the Tuvalu High Commission in Suva announced today.

Lauti had led Tuvalu since it won its independence from Britain in 1979.

The High Commission said a new Cabinet would be announced in several days. The election was conducted earlier this month.

Tuvalu, formerly known as the Ellice Islands, has a predominantly Polynesian population of 10,000 occupying islands with a total land area of less than 10 square miles. The atolls are spread over an area of 500,000 square miles north of Fiji.

Section

B

Honolulu

Wednesday, Sept. 20, 1978

First Governor Set for Tuvalu

LONDON (AP) — Penitala Fiatau Teo will become the first governor general of Tuvalu, formerly the Ellice Islands, when the Pacific group becomes independent from Britain next month.

Penitala, 67, represented the islands at overseas conferences for many years. He joined the Gilbert and Ellice Islands civil service in 1930 as an assistant schoolmaster, became district commissioner in 1957 and retired in 1970.

Tuvalu is made up of nine coral atolls in the southwest Pacific.

Tuvalu's tiny metropolis

FUNAFUTI, Tuvalu — Censorship deprived Funafuti of a moment of glory in World War II. Reporters were allowed to identify the place only as "Somewhere in the Pacific," which is still the most precise description one is likely to get from most people.

Only twice have these sunny atolls mattered in the affairs of the outside world. The first instance passed with scant public impact even on these palmy shores, and the second occasioned little notice anywhere but here. However, the two little-known happenings, obscure as they were, are Tuvalu's contribution to history.

IN 1897, A professor of geology at the University of Sydney, Australia, drilled a hole in Funafuti to test Charles Darwin's theory that atolls like this were formed by the growth of coral formations around a volcanic

robert trumbull

The writer was a foreign correspondent for the New York Times for 36 years, mostly in Asia and the Pacific, and now does special assignments for that newspaper from a Honolulu base. He writes this column for The Advertiser.

peak that later sank beneath the sea, leaving behind a coral collar that eventually became inhabited islands.

In the depths of the bore on Funafuti, which went down 1,114 feet the geologist found marine organisms that exist only in shallow water, showing that Darwin was right. The discovery was scarcely a stop-press item in the newspapers of the day, but it made Funafuti a significant name in the annals of science.

Tuvalu, a name meaning "eight (atolls) together" — actually there are nine, but one is uninhabited — was then a British colony known as the Ellice Islands, after Edward Ellice, a British merchant and politician who had financed the voyage of discovery that gave the

British their claim to the place. The captain of the vessel was an American named De Peyster, and the United States also claimed Funafuti till recently.

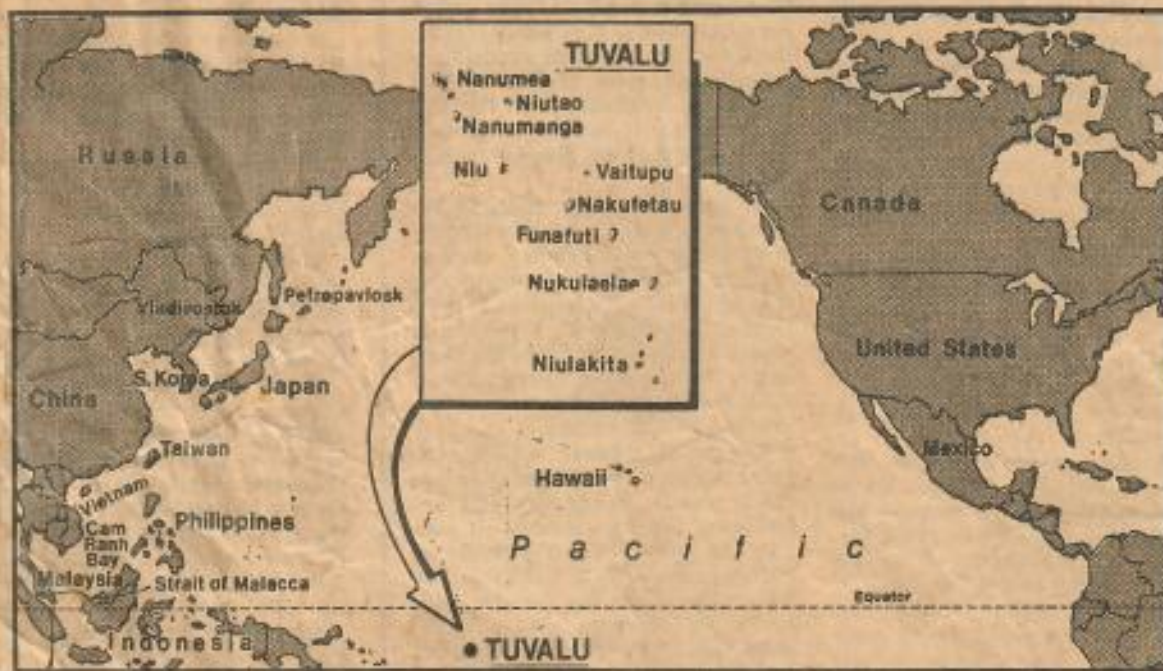
"The Ellice," as the British called the colony informally, remained a minor outpost of empire known mainly to missionaries and island traders until the United States Marines arrived on Funafuti and the outlying atolls of Nanumea and Nukufetau early in World War II.

PEOPLE ON Funafuti still tell a visitor how the Seabees laid down the airstrip in 10 days and they point out the pit where the Americans mined the fill for the runway and to extend the width of the island, which looks from the air like a thin curve of green ribbon flung on the sea. The airfield, now covered with grass, is still in use as the country's international airport.

The war touched the Ellice lightly until two dozen American B-24s arrived from Hickam Field in April 1943. One day they attacked the phosphate works and military installations on the Japanese-held island of Nauru, 1,000 miles northwest, and next hit Tarawa in the Gilberts, which the Japanese had captured from the British two years before.

This was the first use of long-range bombing anywhere, proving that planes could be staged out of Hawaii to plaster targets more than 2,000 miles from home base. And it was the beginning of the campaign to recapture the Gilberts (now the Republic of Kiribati), which culminated in the bloody battle of Tarawa. It also started the long, hard island-hopping drive through the Central Pacific to Tokyo.

AT 3:30 A.M. on April 23, 1943, in brilliant moonlight, the Japanese retaliated with five punishing air strikes on Funafuti. Maheu Nanaseni, now the Tuvalu government's minister of works and local government, recalled vividly the other day how the island's church was demolished by a bomb and a friend, leaving his bed to see what was going on, had half his head blown away.



Some Americans were killed too. And for Funafuti that night was the whole war, for the Ellice never figured in combat again.

Funafuti today is the capital of the sovereign state of Tuvalu, which became independent on Oct. 1, 1978. It must be one of the least urban capitals in the world, as befits a country that preserves the ambience of South Sea Islands as Robert Louis Stevenson knew them.

The one-story frame or concrete-block houses strung along the lagoon side of the airstrip have the look of a rural village anywhere in the tropics except for the one government office building, which is also a one-story concrete structure. The airport terminal is a tiny, open-sided shed with plain wooden counters for the customs and immigration people. The hotel, a three-minute walk, has eight rooms.

But for Tuvalu, Funafuti is a metropolis. Only one other atoll — Vaitupu, where the country's one high

school is — has electricity. Prime Minister Toalipi Lauti estimates that 80 percent of the 9,000 Tuvaluans, all Polynesians, live pretty much as they always have on coconuts, bananas, other fruits, taro and fish, seldom having use for money.

WHAT ARE THE future prospects of a country like Tuvalu? Not much. More and better coconuts. More postage stamps for collectors, now the largest single money-earner, but this must not be overdone or the market will dry up. More foreign aid, but only as much as the country can swallow. More license fees from countries like Japan that want to fish in Tuvaluan water, but there is a limit to that, too.

As for tourism, in Tuvalu there is more profit in sending people out than in bringing visitors in, at least for now. Much of the nation's cash inflow comes from remittances to families by Tuvaluans working in the Nauru phosphate industry or as merchant seamen, a profession in which they are very good.

16 October 1979

ORIGINAL: ENGLISH

SOUTH PACIFIC COMMISSION

JOINT SPC-NMFS WORKSHOP ON MARINE TURTLES
IN THE TROPICAL PACIFIC ISLANDS

(Noumea, New Caledonia, 11 - 14 December 1979)

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THE TURTLE STATUS IN TUVALU

by E. Pita
Fisheries Officer
Fisheries Division
Tuvalu

SUMMARY

Turtles have never been regarded in the past in Tuvalu as animals which needed to be protected. The islands of the country have a turtle resource that needs to be quantified through detailed survey. To date no legislation has been passed to protect turtles. The people hunt these animals during the turtle seasons. Although turtle meat is much preferred to imported meat, this trend is evident only in the outer islands. Turtle farming has been carried out in the past but it is very unlikely this will become commercial in future.

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INTRODUCTION

Long before the Europeans came to the Western Pacific, the Ellice Islanders now called Tuvaluans, lived mainly on a subsistence diet of fish, coconuts, breadfruit and root-crops. Turtles were then regarded as exceptionally favoured seafood.

Nowadays, with the importation of refrigerated goods, the consumption of turtle meat is very rare, particularly in the capital, Funafuti. However, in the outer islands, where no refrigeration facilities are available, turtle meat is still a favourite dish and people hunt any turtle seen in the lagoon, reef, or coming ashore for nesting. Hence there is a danger of these animals from becoming extinct in future.

TRADITIONAL CUSTOMS

From the recorded traditional customs there is no mention of customs relating to the protection of these animals. However, the old people in the villages do know the life cycles of turtles and often advise the young people where and when to make hunting trips to the islets several miles from the villages. They either catch them in the lagoons from their canoes, by diving for them, or with the use of nets specially made to trap the turtles on the outer reefs and during high tides (spring tides). These people also can tell where the eggs have been laid. The eggs are usually taken back to the village; some are left to hatch by burying them in sand outside the village houses; others are eaten.

The turtle shells are used for making lures for bonito fishing by pole-and-line.

Turtle farming is known to have been carried out by the local people in one of the islands of Tuvalu, at Niulakita. This is the most southerly situated island and the most isolated one. It is the highest above sea-level, sandy and oval shaped, with two internal ponds. The first inhabitants of this island used to culture turtles in the two ponds and harvest the turtles during their traditional feasts.

Other islands in the group, with passages and lagoons are also known to have nesting areas for turtles and hunting trips are often undertaken throughout the year.

TURTLE SPECIES

Two kinds of turtles are known to be present in Tuvalu. These can be easily identified by the patterns of scales on the head and back, shape of the mouth and overall size, shape and colour of the whole animal.

The most common species found in Tuvalu is the green turtle (Chelonia mydas). These are often seen floating in the sea near the reefs, centre of the lagoon, or feeding on weed in lagoon shallows.

The other species found is the hawksbill turtle (Eretmochelys imbricata) which is often found feeding on shells and small animals round the reefs. This species is found very rarely and is often of a small size.

PRESENT STATUS

In Tuvalu no survey or work has been carried out by the Fisheries Division or other institutions to establish the species and their abundance. However, people hunt for turtles during the season, especially in three of the outer islands. They use powered boats and an average of 20-30 turtles are caught per month. On the capital, Funafuti, people usually go out to islets and await the turtles coming ashore for nesting. At times they catch the turtles and even collect all the eggs laid. In addition, it is becoming a practice to use spears to hunt turtles in the lagoon or in the outer reefs.

These activities, if allowed to continue, would be a big pressure on the turtle stocks and if left unchecked could result in serious depletion, if not destruction, of these animals. In Tuvalu, no legislation or by-law exists prohibiting the killing of turtles, particularly those coming ashore for nesting.

CONCLUSION

It is vitally important that some legislation or by-laws be passed prohibiting the hunting of female turtles. A survey should be carried out by the Fisheries Division to quantify the resource and to identify the species as well as the future culture of these animals for the domestic market only.

ISLANDS	AVERAGE ANNUAL		YEARS OF RECORD	SOURCE
	RAINFALL, INCHES			
Gilbert Islands:				
Little Makin	100.23		16	13
Butaritari	121.50		16	13
Marakei	71.17		16	13
Abaiang	73.58		16	13
Tarawa	64.02		15	13
Maiana	57.32		16	13
Abemama	53.04		15	13
Kurea	48.57		11	13
Aranuka	49.72		12	13
Nonouti	43.18		13	13
Tabiteuea	40.98		16	13
Beru	45.29		14	13
Nikunau	42.10		14	13
Onotoa	45.83		18	13
Tamana	50.39		13	13
Arorae	52.30		13	13
Ellice Islands:				
Nanumea	121		4	12
Niutao	119		5	12
Nanumanga	92		1	12
Nui	123		5	12
Vaitupu	124		5	12
Nukunetau	117		1	12
Funafuti	133		5	12
Nikulae	145		2	12
Nurakita	141		1	12
Tuamotu Islands:				
Hikueru	55		4	14
Takarua	59		4	14
Mopilia	73		4	14
Raroia	46		1	15
Makatca (raised atoll)	58		4	14

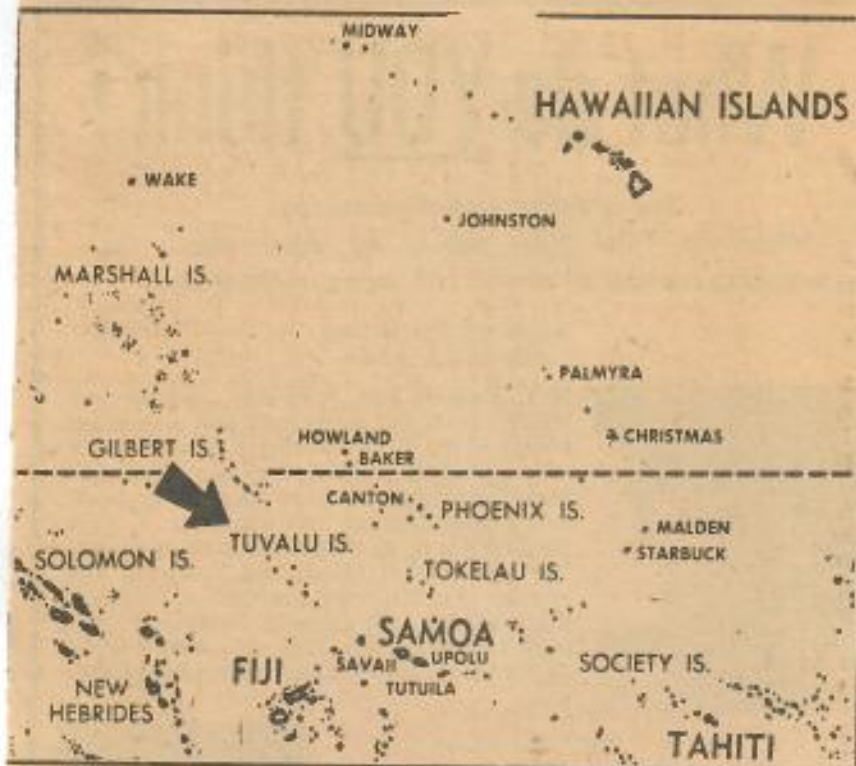
SOURCE:

1. Fosberg (1956).
2. U. S. Navy (1944).
3. Stone (1951).

4. Murphy (1950, p. 61).
5. U. S. Navy (1952).
6. U. S. Navy (1943).
7. Gressitt (1952).
8. U. S. Weather Bureau (1955; 1956).
9. New Zealand Meteorological Service (1956).
10. New Zealand Meteorological Service (1955).
11. New Zealand Meteorological Service (1957).
12. New Zealand Meteorological Service, Annual Meteorological Summary, Suva, Fiji, 1950-1955.
13. Sachet (1957).
14. Service Meteorologique No. 22/MET, as contained in a letter to the author from J. Huber, Secretary General to the Governor of French Polynesia, January 22, 1960.
15. Danielsson (1955).

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Britain to Free Tuvalu Islands

LONDON (UPI) — Britain today started moves to give independence to one of its last remaining flyspeck colonial possessions, the tiny Tuvalu group in the southwest Pacific.

A delegation representing the 10,000 islanders headed by their chief minister, Toalipi Lauti, began talks on an independence constitution with a British government delegation headed by Foreign Office Minister of State Lord Goronwy-Roberts.

A British spokesman said the talks

were expected to last about 10 days.

Tuvalu, the former Ellice Islands, comprises nine coral atolls near a point where the international date-line cuts the Equator.

It formerly was part of the Gilbert and Ellice Islands colony but broke away and became a separate colony Jan. 1, 1976.

The total land area of Tuvalu is only about 10 square miles.

Few of the atolls are more than 12 feet above sea level.

Tropical Cyclone Bebe Creates a New Land Formation on Funafuti Atoll

Abstract. A huge rubble rampart 18 kilometers long was formed at Funafuti Atoll during tropical cyclone Bebe on 21 October 1972. The material forming the rampart was derived from deeper water offshore. The formation appears to be permanent and indicates that tropical storms may play a significant role in the formation of atoll islets.

On 21 October 1972, tropical cyclone Bebe struck Funafuti Atoll (8°S, 179°E) from the east before heading south toward Rotuma and Fiji. On Funafuti alone the storm rendered 800 residents homeless, killed six people, destroyed thousands of coconut trees, wrecked four ships, and caused extensive erosion. During the cyclone a huge rubble rampart was formed which was nearly as large as many of the islets, stretching almost continuously for 18 km along the southeastern seaward coast of the atoll. A scientific team investigated the new rampart and other damage at Funafuti between 10 and 24 December 1972. This report describes the rampart, its origin, and its possible fate.

Interviews with residents of the atoll provided considerable information about the storm and its effects. Several hundred photographs were also taken at Funafuti. Scuba divers, using marked transect lines and depth gauges, determined the shallow-water bathymetry of the upper windward reef slope at three locations. Field trips and dives were conducted at most regions of the atoll (Fig. 1). Topographic sections at seven points along the northern half of the new rampart were determined with surveying equipment.

Funafuti Atoll is located in the Ellice Islands which are 600 to 1000 km north of the Fiji Islands. On the night of 20 October 1972, the weather to the northeast of the atoll deteriorated steadily. A barometric depression 70 to 100 km east began heading toward Funafuti. The cyclone intensified rapidly during the afternoon and evening of 21 October. During this time the wind direction gradually shifted from south-easterly to southwest while the wind speed steadily climbed to velocities in excess of 50 m/sec. Near midnight a 1- to 2-hour lull in the winds indicated that the eye of the storm was passing over

the main islet (Funafuti). The lowest barometric pressure associated with the storm (954 mbar) was recorded at the Funafuti Meteorological Station at 2200 hours (1000 hours G.M.T.). After the eye had passed, wind velocities again increased from the southwest and west, and, by midday of 22 October, the cyclone had passed to the south of the atoll.

Sea level began to rise during the early afternoon of 21 October and eventually flooded the airstrip located on the main islet to depths of 1.5 m. The flooding coincided with an expected high tide of 2 m due at 1530 hours, according to astronomical tables. Residents of Funafuti later indicated that at 2215 hours (21 October) a single large wave (the storm surge), possibly followed by one or more smaller waves, swamped the eastern half of Funafuti Island, destroying many buildings and killing several people. The surge was still almost 4 m

above the mean high water level after crossing the reef flat and inundating a preexisting high rubble bank stretching continuously along the ocean side of the island. The bank stands about 3 m above the ground level and 4 m above the mean high tide level. The impact of the surge on the bank produced foam and spray up to a height of 15 m. The surge traveled westward across the airstrip to the outskirts of the village area located on the lagoon margin of the island. Damage to the atoll was considerable, especially along southeast-facing shores of islands in the southern half of the atoll. The overall effects of the storm will be reported in more detail elsewhere (1).

The most significant geomorphological effect of the storm was the formation of the nearly continuous rubble rampart on the outer edges of 18 km of the southeastern reef flats. The mean height (above the reef flat) and width of the rampart were 3.5 and 37 m, respectively. The reef flat level roughly corresponds to the mean low tide level. Since the normal tide range is about 1.5 m, much of the rampart is situated well above the intertidal zone. The volume of the new structure is estimated to be 1.4×10^6 m³ and corresponds to a mass of 2.8×10^6 metric tons. The new Bebe rampart appears recessed behind the outer edge of the reef flat (Fig. 2) and extends along all the shallow reef flats of the southeastern coast but failed to be formed sub-areally within the deep passage on either side of Falefatu Island (Fig. 1). There is no consistent correlation between the thickness or shape of the rampart along the coast and the presence or absence of islets. No debris of island origin was seen on the rampart. The structure is commonly one-third to one-half as wide as the islets (Fig. 2). These observations indicate that the rampart material originated from submarine reef slopes offshore.

The mean size (maximum diameters) of surface fragments was about 9 to 10 cm on a representative section of the rampart. The largest storm block observed on the atoll had a maximum dimension of 7 m. Over 99 percent of the mass was composed of particles larger than sand size. Most of the fragments are poorly sorted coral rubble



Fig. 1. Map of Funafuti Atoll showing the location of the Bebe rampart and observation sites during the December 1972 study.



Fig. 2. Aerial photograph looking north along the southern end of Funafuti Island near land transect 2 (see Fig. 1). This photo was taken at 1000 feet on 10 December 1972. From left to right: Funafuti lagoon; Funafuti Island and damaged groves of coconut trees; the new storm rampart built by cyclone Bebe on 21 October 1972; the breaker zone and edge of the reef flat; and the South Pacific Ocean. Note the anomalies in the new rampart where material appears to have been moved landward. Also note the greater breadth of the rampart at the bottom of the photo.

and shingle (Fig. 3). About 5 percent of the total mass of the new Funafuti rampart was derived from the skeletons of recently living reef corals, most commonly *Acropora*, *Pocillopora*, and *Pavona*.

A moat 2 to 50 m wide separates the storm rampart from the old island shoreline and represents what were formerly the inshore portions of the

submerged pre-Bebe reef flat. The water level rises and falls within the moat during tidal fluctuations.

Some modification of the Bebe rampart had occurred during the 6- to 8-week time interval between the storm and our visit to Funafuti Atoll. One or more steep escarpments, probably formed by post-Bebe wave action, appear along all ocean-facing slopes, and



Fig. 3. Waist-level view from the crest of the new rampart facing east. This photo was taken near the site of land transect 7 (see Fig. 1) near the northeastern end of the rampart.

the mean size of rubble fragments is locally smaller and more sorted. Sand-sized sediment already predominates along some sections of the base of the ocean-facing slope. At some places the offshore water clarity is reduced by fine calcareous sediments in suspension which may be derived in part from the mechanical erosion of rampart fragments. Residents noted that, within 2 weeks after the storm, wave action had moved the northern end of the rampart in toward the old shoreline. Aerial photographs taken 6 weeks later do not indicate any further modification. Rock fragments are also being toppled landward over the crest of the rampart by wave splash. Backwash may be transporting rubble into deeper water offshore. Low-lying anomalies in the new rampart were seen opposite the southern ends of at least three islets (Fig. 2) and are probably present along other sections of the rampart. Less rubble was initially deposited within the anomalies, and the rampart has been locally pushed up against the old islet shoreline. It is not known whether cyclone activity or poststorm wave activity has caused these features.

Snorkeling and scuba dives were carried out immediately offshore from the rampart (Fig. 1) where the reef slopes presumably received the full force of the cyclone. The upper reef buttresses are moderately steep to depths ranging from 2 to 10 m. In deeper water a broad terrace was commonly found to depths of 20 m. Below the outer edge of the terrace, the reef slope is precipitous to depths of 45 to 65 m. At the bottom are found thick deposits of *Halimeda* sand.

Surprisingly, the shallow-water reef framework appeared undamaged, but the normal reef biota was nearly absent. A few coral colonies of *Pocillopora*, *Acropora*, and *Porites* were still partially alive on the walls of the upper buttresses. Corals, echinoids, and small patches of coralline algae were generally confined to recessed pockets and cracks where the destructive effects of surge and scour would have been significantly reduced. At some sites large blocks appear to have been torn loose from the buttresses and deposited on the rampart. Between depths of 2 and 20 m, a filamentous green alga, *Chlorodesmis*, was found colonizing up to 85 percent of the substrate. Residents of Funafuti indicated that, before cyclone Bebe, the reef slope below 5 m had harbored flourishing coral communities. Evidence of storm damage was notice-

able to depths of 20 to 30 m, below which large populations of fish, corals, and normal benthic algae were locally common although *Chlorodesmis* was absent.

The most significant discovery made during the ocean dives was the presence of large quantities of loose rubble at depths between 2 and 20 m. Much of the rubble is similar in size, shape, and composition to that which comprises the new rampart immediately onshore. A series of dives was also conducted near and past the north end of the new rampart (Fig. 1). Where the rampart was not deposited, normal reef biota was abundant and relatively undamaged. Rubble within the groove and beyond the base of the buttresses was present in sufficient quantity to have formed a rampart. Since the rampart along the northeastern coast was not formed as well as that along the northwestern and southwestern coasts, this suggests that the most powerful wave energy during the cyclone was generated from the southeastern quadrant.

We thus conclude that large waves or the storm surge during cyclone Bebe could have transported rubble material up the slope and deposited it on the reef flat to form the rampart. During movement of rubble, the normal reef biota was killed and this enabled pioneers such as filamentous algae to colonize newly available substrates.

Tropical cyclone Bebe was unusual from several standpoints. It is the only severe storm ever recorded for the month of October since the beginning of written weather observations in the southwestern Pacific. On the basis of accurate historical records, Bebe was only the third severe storm to strike Funafuti Atoll during the past 140 years (2). Winds, waves, and surge should reach their greatest development to the left of the center with respect to the direction of movement for cyclones in the Southern Hemisphere (3). Observations at Funafuti, which show that the greatest cyclone damage occurred along the southeastern coasts, do not strongly support the theory. For such a small, slow-moving cyclone, Bebe produced a phenomenal storm surge; faster moving typhoons usually produce large surges (4). The storm surge height of cyclone Bebe at Funafuti also appears to be much higher than would be predicted by formulas based upon the lowest observed barometric pressures (5). On the basis of a review of available weather data, Ramage has concluded that cyclone

Bebe approached from the east and then executed a clockwise loop in the vicinity of the southeastern coast of Funafuti Atoll before heading south. Looping seldom occurs over an atoll, and we thus tentatively conclude that the unusual movement of the storm may have contributed to the development of the possible storm surge and to the subsequent damage and deposition at the atoll.

Other studies have shown that the intensity of a tropical cyclone may bear little relation to its depositional effects (6, 7). In one study (8) it was found that two hurricanes of similar size, which passed over the same region of the Florida Keys within 5 years of each other, effected noticeably different changes. The first storm was largely depositional while the second caused extensive erosion. Factors which determine whether a storm will produce net erosional or net depositional effects include not only the direction of storm movement and the predicted tide level but also the presence or absence of loose rubble deposits at moderately shallow depths.

Although the formation of large rubble banks during tropical storms has been noted in the past (9), none has been nearly as large or as extensive as the Bebe rampart at Funafuti. Since no one observed the formation of this rampart, it remains an enigma whether a possible storm surge, storm waves, or both, contributed toward its construction. Although some studies have indicated that storm surges are very destructive events (10), these do not always develop during a cyclone. A series of large waves separated by intervals of 20 minutes caused most of the damage at Jaluit Atoll during cyclone Ophelia (11).

It appears that the new rampart will be a permanent feature of Funafuti in one form or another. Although wave action may continue to erode and modify the structure, this process may become less effective as the front slope of the rampart becomes more removed from the outer reef edge. Landward movement of rubble bars at Jaluit (12) and reef debris in British Honduras (10) occurred within 3 years after their deposition by storms. It is assumed that lagoonward movement of the Funafuti rampart will increase the probability of its permanence.

Through one process or another, much of the rampart may eventually be incorporated as atoll land. It is possible that much of the material forming

atoll islets may initially have been derived from reef flat deposits formed during storms. Formation of deposits during storms may be normal on Indo-Pacific atolls and also common on Atlantic reefs (7, 13, 14). The formation of rubble bars on Jaluit Atoll may occur as frequently as every 30 years (13).

Newell and Bloom have concluded that islet formation on Raroia (Tuamotu Islands) has been principally accomplished in the last 800 years during typhoons (15). Ball *et al.* have indicated that depositional activity in the Florida Keys by infrequent tropical storms is more important than the sum total of other events (16). In the same manner, deposition on Funafuti during cyclone Bebe may also have been much greater than deposition during all other time periods within the last century. Although severe tropical cyclones may be considered to be infrequent phenomena, from a geological time perspective they may play a significant role in the accretion and formation of atoll islets.

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References and Notes

1. G. B. K. Baines, P. J. Beveridge, J. E. Maragos, *Proc. 2nd Int. Symp. Coral Reefs*, Queensland, Australia, June 1973, in press; P. J. Beveridge, J. E. Maragos, G. B. K. Baines, in preparation.
2. *Pacific Islands Pilot* (Great Britain Hydrographic Office, London, ed. 2, 1908), p. 196; S. S. Vischer, *Bull. Bernice P. Bishop Mus.* 20, 1 (1925); J. W. Hutchings, *N.Z. Geogr.* 9, 42 (1953).
3. A. Fore, *Mon. Weather Rev.* 85, 385 (1957); G. E. Dunn and B. J. Miller, *Atlantic Hurricanes* (Louisiana State Univ. Press, Baton Rouge, 1960), pp. 206-221.
4. C. S. Ramage, *U.S. Air Force Contrib. No. AF19 (604)-7229 (3)* (1961), p. 9.
5. W. C. Conner, R. H. Kraft, D. L. Harris, *Mon. Weather Rev.* 85, 113 (1957).
6. C. Darwin, *Structure and Distribution of Coral Reefs* (London, 1842), p. 129.
7. H. J. Wiens, *Atoll Environment and Ecology* (Yale Univ. Press, New Haven, Conn., 1962), pp. 162-186, 474-478; D. R. Stoddart, in *Applied Coastal Geomorphology*, J. A. Steers, Ed. (Macmillan, London, 1971), pp. 155-197.
8. R. D. Perkins and P. Enos, *J. Geol.* 76, 710 (1968).
9. D. I. Blumenstock, *Nature* 182, 267 (1958); W. A. Bryan, *Occas. Pap. Bernice P. Bishop Mus.* 2, 77 (1953).
10. D. R. Stoddart, *Nature* 207, 589 (1965).
11. D. I. Blumenstock, *Atoll Res. Bull.* 75, 5 (1961).
12. ———, F. R. Fosberg, C. G. Johnson, *Nature* 189, 618 (1961).
13. E. D. McKee, *J. Sediment. Petrology* 29, 354 (1959).
14. R. W. Fairbridge and C. Teichert, *Geogr. J.* 3, 67 (1948); W. G. McInnis and H. J. Walker, *Ann. Ass. Amer. Geogr.* 54, 582 (1964); P. W. Glynn, L. R. Almodovar, J. G. Gonzalez, *Carib. J. Sci.* 4, 335 (1965); J. R.

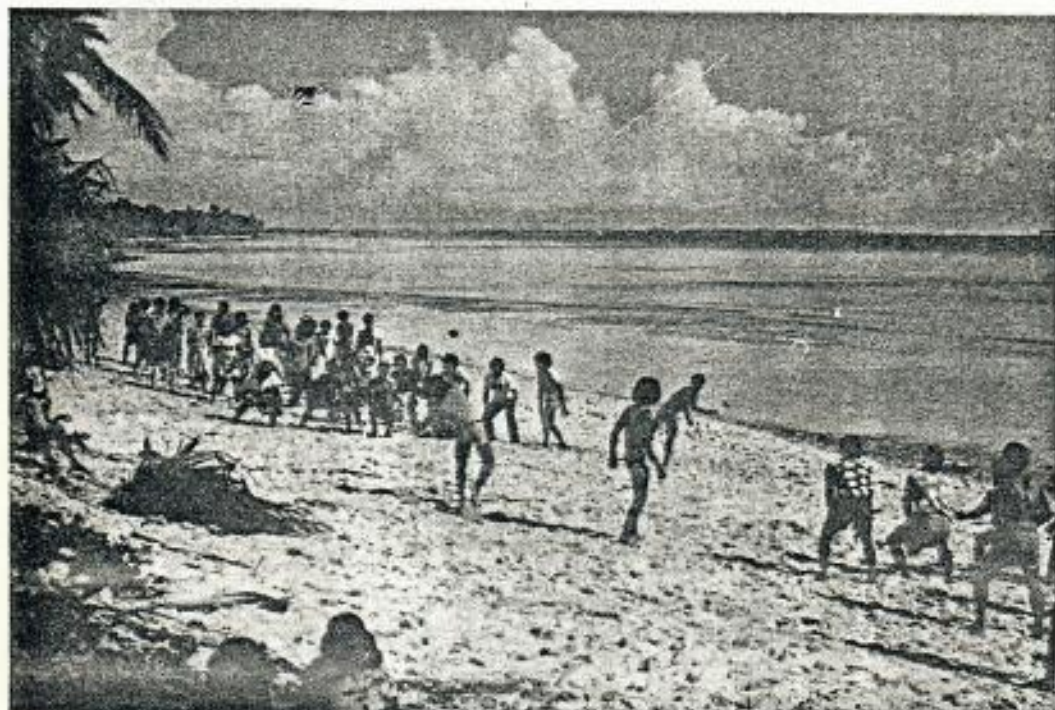
- Curry, F. P. Shepard, H. H. Veeh, *Geol. Soc. Amer. Bull.* 81, 1865 (1970).
15. N. D. Newell, *Atoll Res. Bull.* 36, 24 (1954); *Bull. Amer. Mus. Natur. Hist.* 109 (No. 3), 311 (1956); — and A. L. Bloom, *Geol. Soc. Amer. Bull.* 81, 1881 (1970).
16. M. M. Ball, E. A. Shinn, K. W. Stockman, *J. Geol.* 75, 583 (1967).
17. We thank L. B. B. Blackhall, who first informed us of the rampart phenomenon at Funafuti; Gordon Groves, who provided considerable assistance and support for this study; and the following organizations and individuals, who contributed information and material assistance: the Gilbert and Ellice

Island Colony Administration; the people of Funafuti; the New Zealand Meteorological Service; the Royal New Zealand Air Force; Air Pacific, the PEACESAT communication system; Maxwell Doty; Arthur Downing; Douglas Inman; John Murdoch; Trician Pullen; Colin Ramage; and Dick Stroup. This study was supported under grant GA-17137 and sea grant 04-3-153-29, both from the National Science Foundation. Hawaii Institute of Geophysics Contribution 556. Hawaii Institute of Marine Biology Contribution 417. Cormar Contribution No. 1.

16 April 1973

The stamps of Tuvalu

By FRANK O'CONNELL,
SPC Publications Bureau



Tuvaluans playing Te Ano on a beach; this is the game featured on the 35c definitive stamp.



What sort of a country is Tuvalu, one of the most recently arisen stars in the philatelic galaxy? Tuvalu is a group of nine atolls in the central Pacific stretching more than 560 km from Nanumea north to Niulakita. These nine islands spread over an area of more than a million square miles, yet there is just on 30 square kilometres of land, most of it no more than three metres above sea level.

On January 1, 1976, Tuvalu became a Crown Colony in its own right. Formerly the Ellice Islands, with a Polynesian population, it was legally separated from the Gilbert Islands (with which it formed the Gilbert & Ellice Islands Colony) on 1 October, 1975. The final break came in January 1976 when Tuvalu was empowered to negotiate with London direct and not through Tarawa. The capital, Funafuti, is 1,200 km north of Suva; it was almost entirely destroyed by hurricane in 1972.

There are some 7,500 Tuvaluans, many of whom go to other countries to find work. The country's only industry is a modest copra production: it exports about 500 tonnes a year to Suva. A delegation of members of government and church, led by the Hon. Chief Minister, Toalipi Lauti, was in London early this year negotiating the terms of their independence from Britain.

This is the small, determined country which established as one of its first activities (in Decem-

ber 1975) a philatelic bureau. Stamps are a valuable earner of foreign exchange and if the issuing country maintains a careful policy on the number of issues and pays particular attention to design and subject matter, stamps can provide a continuing source of revenue. With just over two years of stamp production behind it, Tuvalu has an excellent worldwide reputation due to its conservative issuing policy and a very helpful staff at the Bureau in Funafuti managed originally by Anthony Kennett and, since June 1977, by Frank Hoy.

Right from the beginning, the Tuvalu Philatelic Bureau produced a roneoed publication titled *News and Views* (first issue dated March 1976) which not only gives details of current and forthcoming issues, but also information on aspects of Tuvaluan culture and chatty biographies of Bureau staff members. There are at least 20 local staff regularly employed and, when the pressure is on, this rises to 40.

The first stamps issued by Tuvalu appeared on the day it officially separated from the Gilbert Islands; 1 January, 1976. There were two groups of stamps; 15 provisional definitives with 'TUVALU' overprinted on the old 'Gilbert & Ellice Islands' name; and a set of three new Separation commemoratives. A limited number of the definitives was issued and all unsold copies



Tuvalu's first stamps, issued on Separation Day, 1 January, 1976; three new stamps and an overprint of the existing Gilbert & Ellice Islands definitives; values not shown here are on the front cover.

terested in the quantities sold; they were:

1c — 80,429; 2c — 64,613; 3c — 68,773; 4c — 56,163; 5c — 66,024; 6c — 52,994; 8c — 52,651; 10c — 54,753; 15c — 53,017; 20c — 53,920; 25c — 57,551; 35c — 51,882; 50c — 55,447; \$1 — 54,273; \$2 — 57,091.

The separation issues were designed by Iakopo Niuatui and J.E. Cooter and printed litho by Questa Colour in sheets of 50 with gutter pairs CA watermarked. This special issue was withdrawn after three months on 31 March, 1976 with the following quantities being sold:

4c — heads of a Gilbertese and a Tuvaluan (39,662);

10c — a map of the islands (44,992);

35c — Gilbertese and Tuvaluan canoes (51,642).

Each stamp was divided in half by a black strip with the words, 'SEPARATION January 1st 1976', in reverse running the full length of the band.

The British Royal Mint had been instructed to produce a series of nine new coins for Tuvalu and



withdrawn when the new pictorial definitives appeared a few months later.

The designer of the overprinted definitives was G. Drummond and the printers Walsall Security; they were issued in sheets of 50 with gutter pairs and CA watermarked. Philatelists may be in-

terested in the quantities sold; they were: this new coinage became the subject of the next issue, on April 21. Four excellent designs by G. Drummond were handsomely printed by Walsall Security; all multicoloured verticals. The 5c stamp showed an octopus and a 50c coin; the 10c stamp had a Red Eyed Crab and a 10c coin; the



Four stamps were issued on April 21, 1976, to commemorate Tuvalu's new coinage.

15c stamp had a flying fish on both stamp and 20c coin featured; the 35c stamp also had the same design on the \$1 coin it featured — a green turtle. When withdrawn on 20 July 1976, the

following had been sold:

5c — 42,652; 10c — 38,733; 15c — 39,425;
35c — 44,541.



The first set of definitives, replacing the overprinted GEIC stamps, was issued on July 1, 1976.

On June 30, 1976, the provisional definitives were withdrawn and on the first of July, 14 (the 3c stamp was dropped) new pictorial definitives were issued. Designed by J.E. Cooter and printed by Questa, these are current. Ten values all show the islands of Tuvalu with either some animal plant or cultural object: 1c — Niulakita and a Leathery Turtle; 2c — Nukulaelae and a sleeping mat; 4c — Nui and a Talo vegetable; 5c — Nanumanga and a grass dancing skirt; 6c — Nukufetau and a coconut crab; 8c — Funafuti, the capital, and a banana tree; 10c — a general map of the group of islands; 15c — Niutao and a flying fish; 20c — Vaitupu and a Maneapa house; 25c — Nanumea and a palu fish hook.

The 35c value shows men playing the Te Ano game; the 50c stamp, canoe pole fishing; the \$1 stamp, reef fishing by flare; the \$2 stamp, a living house.

Postage rates had increased earlier in the year and it became apparent that a higher denomination than \$2 was required. So, on 1 Sep-

plus two labels. The values, subjects and numbers sold were:

5c — titlepage of the New Testament recently translated into Tuvaluan (39,821);

20c — the Lotolelei church, Nanumea (39,742);

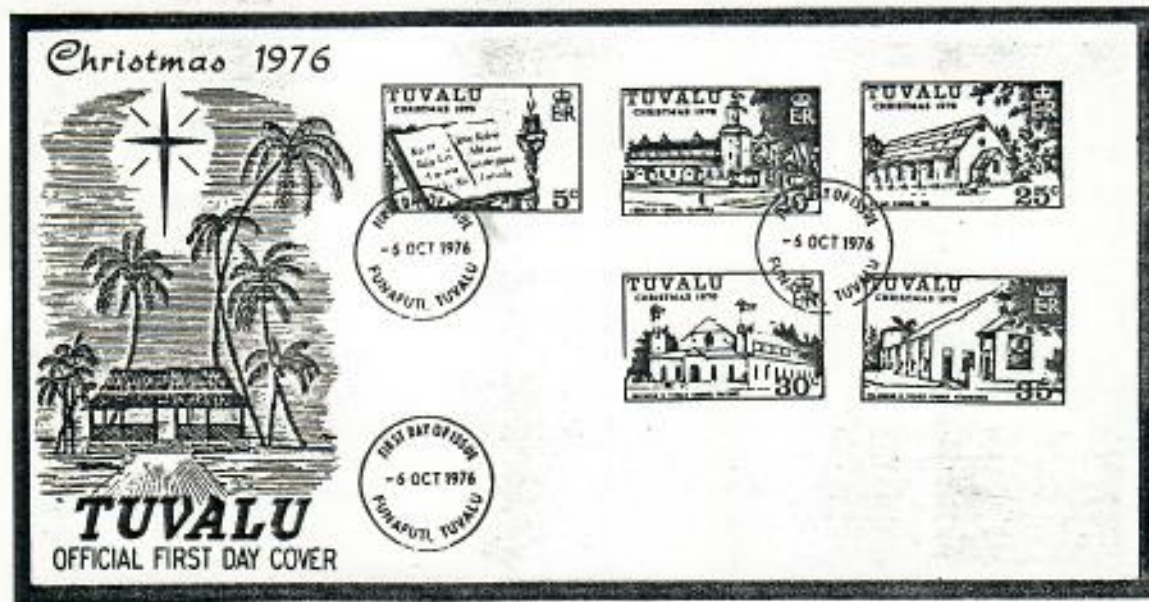
25c — the Kelupi church, Nui (39,950);

30c — the Mataloa O Tuvalu church, Vaitupu (39,800);

35c — the Palataiso O Keliso church, Nanumanga (39,060).

The first issue for 1977 came in February with three stamps to commemorate the Silver Jubilee of Queen Elizabeth II.

They were designed by Julian Vasarhelyi and printed by Format International in sheets of 50 with gutter pairs and no watermark. A miniature sheet containing all three values was also issued. The stamps, and numbers sold, were a record for Tuvalu:



First day cover of Tuvalu's first Christmas issue.

tember, 1976, a \$5 stamp featuring the Tuvalu Colony ship, *MV Nivanga*, was issued. This ship was built in Hong Kong in 1962 for the GEIC government and given as a deed of gift to Tuvalu on 8 December, 1975. It gives the only regular sea service to the islands. The stamp was designed by Cooter and printed by Questa on CA watermarked sheets of 50.

The last issue for 1976 was the Christmas issue of five stamps which appeared on October 6, and colourful stamps they were. G. Drummond was the designer and Harrison & Sons the printers; the stamps came in CA watermarked sheets of ten

15c — the Queen and the Duke on the balcony of Buckingham Palace after the coronation (123,448);

35c — the Duke of Edinburgh being carried ashore by canoe at Vaitupu (114,334);

50c — the Queen leaving the Palace for the coronation (119,851); Miniature sheets (74,405).

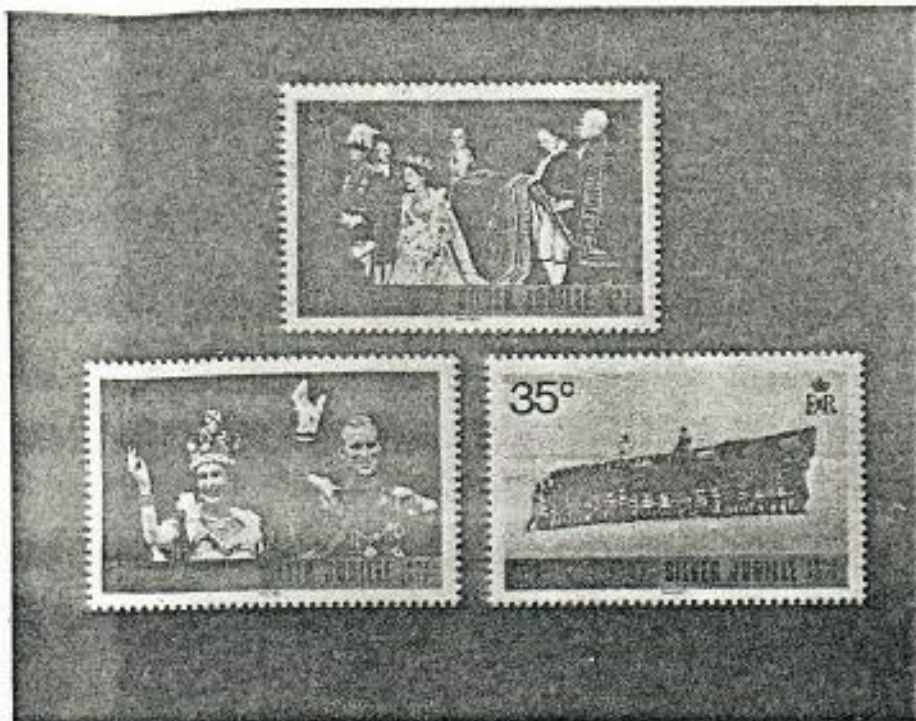
This issue was an unexpected bonanza! As can be seen, the totals far exceeded anything sold before and the Bureau had to recruit an additional 24 part-time workers to help process the orders. The stamps sold out

several weeks before the three-month period normally allowed the special issues.

Tuvalu was one of the Pacific countries which honoured the South Pacific Commission by issuing a set of commemoratives on its thirtieth anniversary. The March 1977 issue of *News and Views* carried a long article on the SPC and its work to let philatelists know why Tuvalu was making this particular issue. The set was designed by Ian Oliver and printed by Format International multicoloured in sheets of 25 with no watermark. The subjects and numbers sold were: 5c — Health (288,266); 20c — Education (28,125); 30c — Fruit Growing (28,262); and 35c — SPC territory (28,106).

This set was issued on May 4, withdrawn on August 3.

Towards June 1977, the Funafuti Post Office began reprinting some denominations of the new



By far the most popular issue to date was the commemoration of Queen Elizabeth's jubilee. The stamps came out on February 9, 1977 and each of the three values sold well over 110,000.

definitives to cope with demand and collectors noted some variations in shades. The new definitive printing was, on unwatermarked paper where the original had been CA watermarked. The \$5 stamp was also reprinted at this time and it, too, switched to unwatermarked paper.

To commemorate the fiftieth anniversary of Scouting in the Central Pacific, four stamps were issued on 10 August, 1977. As with the SPC set, these were designed by Ian Oliver and printed by Format in sheets of 25 on unwatermarked paper. Values and quantities sold were:

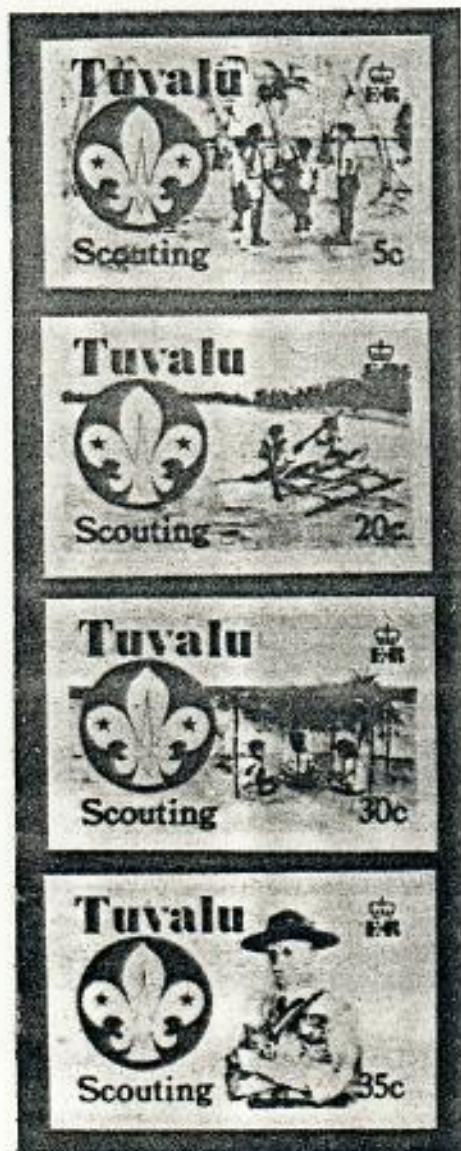
- 5c — investiture of a new recruit (35,146);
- 20c — two scouts in a Tuvaluan canoe (35,341);
- 30c — three scouts in a shelter (35,154);
- 35c — Baden Powell, the founder of Scouting (35,242).

Included in these totals were 2,040 first day covers. The issue was withdrawn on September 9.

The last issue for 1977 commemorated the Royal Society Expeditions of 1896-97, which we described in our 4th October, 1977 issue, page 48. Quantities sold were: 5c (Hurricane Beach) — 36,852; 20c (*HMS Porpoise*) — 35,341; 30c (Dredging chart) — 36,801; 35c (Charles Darwin) — 69,465.

New postal rates came into effect on 1 January, 1978 and a new set of stamps, a special issue of the wild birds of Tuvalu, came out on 25 January; the values and subjects were:

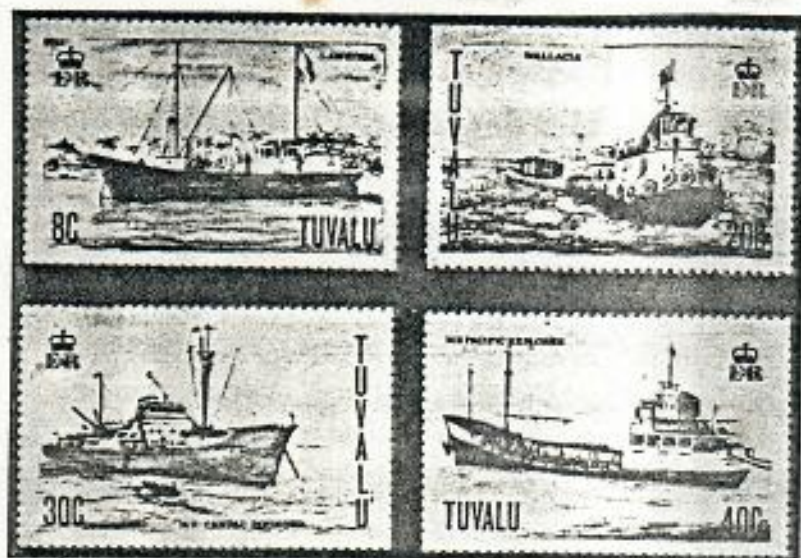
- 8c — Pacific Pigeon (or *Lupe*);



The 50th anniversary of Scouting in the Central Pacific was commemorated.



New postal rates in January 1978 saw a new special issue on wild birds.



The sea is a vital link with the outside world and on April 5, 1978, four stamps commemorated ships which regularly call at Funafuti.



Two new definitives were issued on April 19 this year to meet demands caused by new postal rates.

- 20c — Reef Heron (*Matuku*);
- 30c — Fairy Tern (*Matapula*); and
- 40c — Lesser Frigate Bird (*Katokula*).

This series was designed by G. Drummond and printed by Format in multicoloured sheets of 20, no watermark. The *Katokula* and *Lupe* are con-

sidered delicacies in Tuvalu. There was a remarkably strong demand for this issue and it completely sold out, with sales around 39,000 sets.

April 5, 1978, was the release date of an attractive set of four stamps depicting ships which regularly visit Funafuti with cargoes of mainly food and raw materials. Designed by Ian Oliver and printed by Format in multicoloured sheets of 16 with horizontal and vertical gutters, the values and subjects are:

- 8c — *SMV Lawedua*; 20c — *Tug MV Wallacia*;
- 30c — *MV Cenpac Rounder*; 40c — *MV Pacific Explorer*.

The Philatelic Bureau expects sales to exceed 50,000 sets.

The new postal rates made it necessary to provide two new definitives and these were issued on April 19:

- 30c — Pandanus tree; 40c — the Fatele dance.

J.E. Cooter designed them and Questa printed in sheets of 50 with no watermark.

To mark the twenty-fifth anniversary of Queen Elizabeth's coronation a set was issued on June 2, four values showing British cathedrals, the Royal Cypher and inscribed 'Defender of the Faith'. Gordon Drummond is again the designer and Format the printer; the stamps are printed in sheetlets of 12-ten stamps and two labels — and a miniature sheet has also been printed. The cathedrals are:

- 8c — Canterbury; 30c — Salisbury; 40c — Wells;
- £1 — Hereford.

Advance orders were heavy and, some two months before issue date, sales exceeded 150,000 sets.

The final issues schedules for 1978 will appear in October.



*25th. Anniversary of the Coronation
of Queen Elizabeth II, 1953 - 1978*

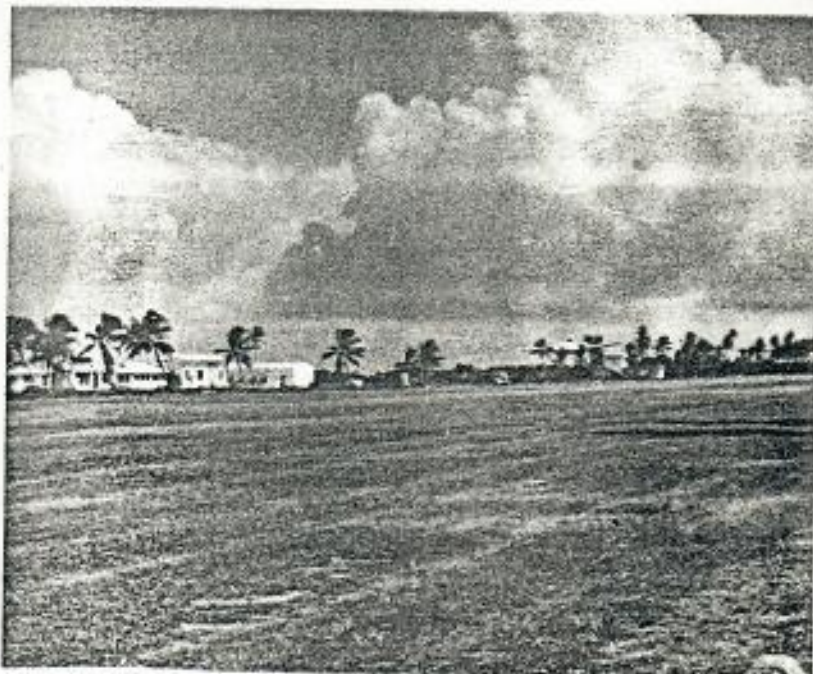
A set of four Tuvalu flowers will appear on October 4, designed by John Cooter and printed by Format in sheets of 16, the 8c, 20c, 30c and 40c stamps depict Puafiti, Tiale, Inato and Susana.

On October 1, to mark the occasion of Tuvalu's independence, seven low value definitives will be overprinted by Questa. The values will be 8c, 10c, 15c, 20c, 30c, 35c and 40c.

Philatelists Ltd., a subsidiary of Urch Harris Ltd of Bristol (UK), run the Bureau for the Tuvalu government; Frank Hoy, their manager, for many years managed the Philatelic Bureau in Southampton for the British Post Office. Urch Harris are the largest dealers in modern stamps in the world and have managed bureaux in the West Indies for years; this is their first Pacific venture. Their John King, with more than 30 years' experience, commutes between Bristol, the Caribbean and the Pacific, visiting Tuvalu twice a year to meet with government on subjects, artwork, printing, publicity, promotion and shipping of stamps.

The brief history of Tuvalu's philatelic activities indicates not only the international popularity of stamp collecting, but shows how a carefully planned policy of stamp issues can help a developing economy. Business is increasing for the Bureau with each mail, when more than 500 letters are received and it is not uncommon for 2,000 orders to be despatched at a time. This year, Tuvalu will earn more than \$750,000 in foreign exchange

from postage stamps; when extensions to the existing building are added, ten new staff will be recruited. It is obvious that a well conducted Bureau should be seriously considered by any Pacific territory wanting to increase employment and add to revenue.□



The airport at Funafuti.

OCT 23 1978

south pacific

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BULLETIN

QUARTERLY PUBLICATION OF THE SOUTH PACIFIC COMMISSION

SECOND QUARTER 1978



Fisheries Division,
Funafuti,
Tuvalu.

25th January 1980

Mr. George H. Balazs
IUCN/SSC Marine Turtle Group,
University of Hawaii

Dear George:

Thank you very much for your letter and for your very good booklet on marine wild life in the Hawaiian islands.

I honestly had not forgotten your request, simply that returning after a three week trip results in a backlog of correspondence and things to clear up.

Please find enclosed two of the $\frac{1}{2}$ coins with the green turtle, and five of the 1 cent stamps featuring the leatherback turtle.

On the question of the latter in Niulakita, the Manager of the Philatelic Bureau here assures me that they always lay stress on accuracy. The design for this particular stamp was made in 1976, we are now checking on the Philatelic's source of information for that stamp.

If we have any more information of leatherback turtles on Niulakita I will be sure to let you know.

If you require any more coins I can send them with no trouble, however more stamps will be difficult. It was tough getting these five and the only way to get more of them would be to buy the whole mint set; and there are not too many of those left either.

Best of luck with your research and the turtle hunting.



K. Machell

Fish Processing Officer

Australian doctor Stephen R. Weinstein recently did a four-week duty tour of Tuvalu. His work took him to all of the country's eight islands. Below he turns in a keenly observed account of his experience, in which among other things he suggests that Tuvalu's potential as a tourist destination is greater than many people might think.

Journey of discovery to the eight unspoiled islands of Tuvalu

Not long ago I spent four weeks in Tuvalu on a research trip to gather data on the growth and nutrition of Pacific Island schoolchildren, as compared with Australian. Put briefly, it was found that Tuvaluan children are sturdier and better nourished than many of their counterparts in parts of Polynesia which have adopted a more Western way of life. Tuvalu was chosen for the study because, among other things, its lifestyle is still quite traditional, and only the main island of Funafuti is modernised to any extent.

Though I spent only a short time in the 'colony', as some older locals still refer to their islands (although they became independent on October 1, 1978), I had the good fortune to get on the inter-island ship and visit all eight islands, including those most remote from Funafuti, and hence the outside world. Through associating nearly exclusively with the locals, and gaining conversational ability in their language (made possible by previous knowledge of other Polynesian dialects), I was able to gain more insight into the Tuvaluan way of life at the dawn of their nationhood than would normally have been possible in the time I had there.

The Tuvaluan language is a western Polynesian dialect very similar to that spoken in Samoa, the Tokelau and Wallis Island, and mutually understood by people from these places. The linguistic affinity, as well as the similarity in material culture between Tuvalu and Samoa, originates in the traditional Polynesian navigations, as all these places were settled at roughly the

same time by people from a common culture.

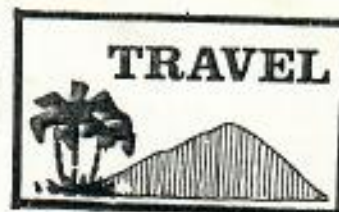
Funafuti, the main island, is like most of the others, made up of a circle of coral islets around a deep lagoon. The islets, only one of which is permanently inhabited, are surrounded by fringing reefs, and both lagoon and sea are indescribably rich in fish and other sea life. Being the only one of the islands with a more or less European way of life, Funafuti has about a dozen cars, newish weatherboard houses, a tumbledown cinema, shops, and a small hotel that is the centre of the European community's social life.

There were fewer than 20 *palangis* (whites) in Funafuti at the time of my visit (this year there are a few more), all of whom are there to do certain jobs on a short-term basis, and consequently there are fewer of the colourful 'beachcomber' types who have made permanent homes for themselves

on other Pacific islands. Except for the island of Vaitupu, which has some British volunteer teachers and agricultural experts, none of the other islands has white residents. Most of the buildings in Funafuti were swept away in a cyclone in 1972 - another factor which accounts for the relatively new houses there.

The Hotel, *Vaiaku Langi*, is the only one in the country, with nightly accommodation fees from \$7.50 to \$14 (all prices in Australian currency, which is used on Tuvalu - Tuvalu has its own coins, but Australian notes are used). Often the hotel may be empty for several weeks due to the scarcity of visitors. But the bar - the only licensed premises in Tuvalu - always does a good trade from local customers.

All the other islands in the group follow a traditional lifestyle, more so in fact than any other island nation in Polynesia. The cultural simi-



larity with Samoa is noticeable everywhere, the exception being the island of Nui, which was settled by Gilbert Islanders. The language of Nui is a Gilbertese dialect unlike Tuvaluan, and other minor differences show up in things like canoe construction.

Houses are generally made of wooden beams tied together with sennit (coconut rope), with roofs of thatched palm-leaves and open walls where mats are lowered at night and in rainy weather. Floors are covered with coral pebbles and mats of woven coconut and pandanus leaves. Furnishings usually consist of a few old trunks and chests, with a wire-mesh meat safe in one corner. These days, battery-operated cassette recorders are becoming common in many households. Most houses have a small 'bath-house', a square enclosure of shoulder-high screens of coconut leaves.

Canoes are of the hollowed-out log type with one outrigger, tied together with sennit, or, more commonly, nylon fishing line, and propelled by paddles or a triangular sail. They glide smoothly and rapidly over the mirror-calm lagoon. The custom persists of burying the dead in coffins made from sections of an old canoe hull, ap-



Pandanus-covered canoes on the beach at Vaitupu.

TRAVEL

parently a remnant of the pre-Christian practice of letting a dead man drift out to sea in his canoe.

With very few salaried jobs available, most people live by subsistence agriculture and fishing. Fishing is done with traps, steel hooks and nylon line in both sea and lagoon. However, for the bonito, special hooks made of the traditional pearlshell and tor-toiseshell are used almost exclusively. These hooks are greatly valued.

Every island has its small complex of public buildings: church, *maneapa* (meeting house), primary school, store, guest house and government office — the latter serving also as police office, radio hut and district agent's office — which is decorated with faded portraits of the Royal family. The government-owned guest house is more often than not empty, visitors being a rarity. A nominal nightly charge from \$1-\$5 is made, depending on the facilities. The *maneapa* is

an important Tuvaluan institution, being the scene of all public meetings, weddings and funeral receptions, parties and dances. The *fatela* is the Tuvaluan counterpart of the *hula*, being performed by girls in grass or cotton print skirts, with elders singing and beating out the rhythm on the floor of the *maneapa*.

The church is usually the most impressive building in the village, made of white coral limestone and often dating back to the arrival of the first missionaries (LMS) in the 1860s and '70s. The pastor is an important man in the community, and the Sunday taboo on work, sport, or fishing is upheld more strictly in Tuvalu than in the larger and increasingly secular countries of the Pacific. Sunday services are given in Tuvaluan with emphasis on the hymn-singing so beloved of the Polynesians. Men and women sit in opposite halves of the church, either on ancient pews or pandanus mats.



Traditional dress — Tuvalu style.

Food is necessarily of a limited variety on a coral atoll, the staples being taro, pulaka (a larger, starchier form of taro), coconuts and fish. The latter is the main source of protein and often eaten raw, in which state it is considered a great delicacy. Pork and chicken are eaten too, and recently tinned beef imported from Australia or New Zealand is being consumed in increasing quantities. The only other crops that will grow in the poor, sandy soil are breadfruit, bananas, and sugar cane. These crops must often be tended in specially dug pits filled with fermenting vegetable matter to provide minimal nutrition for their growth.

Fresh water is scarce, obtainable only from rain or from brackish wells dug in the sand. There are no fresh water springs, streams, or pools. 'Toddy', the national drink of Tuvalu, is made by cutting the sap-bearing stalks of a coconut palm and collecting the juice via a leaf-gutter in an empty coconut shell. Fermented, or 'sour toddy', is a favourite intoxicating drink. Toddy is also boiled until it becomes a thick, sweet syrup, eaten with other foods.

The trade store on most islands usually carries a few items of imported food, commonly tinned beef or fish, rice, sugar, tea, and flour. The store also sells other essentials like kerosene (for lamps), tobacco, fishing gear, T-shirts, etc.

The Tuvaluan economy is

heavily dependent on outside development aid, chiefly from Britain, Australia and New Zealand. The only other sources of revenue at present are Tuvaluans working overseas as seamen on foreign ships, or in the phosphate mines of Ocean Island or Nauru, and postage stamps. The latter are large and colorful, known to collectors throughout the world, and produced in quantities far exceeding the postal needs of Tuvalu's 8000 citizens. A small quantity of copra is also exported. There is a pleasant 19th-century flavour about the way sacks of dried copra are manhandled into whaleboats on the outer islands, after which the boats are skilfully manoeuvred through the passage in the reef out to the waiting ship.

Plans are being made for a fishing industry, based on a local cannery to be funded by Australia. Shortly after independence Tuvalu extended its oceanic fishing limit to 200 miles, but with no ocean-going fishing craft of its own it relies on Korean and Taiwanese trawlers to pay licence fees for fish in its waters. (Recently a friend in Funafuti wrote to me that they had 'bagged' a Taiwanese trawler caught fishing 70 miles off-shore.) (PI Sep 1978 p8.)

With fewer than 100 visitors per year there is virtually no tourism in Tuvalu, and because of its small size and remoteness, none is expected in the foreseeable future. However,



Nanumea Village from the church steeple.

in my opinion Tuvalu has a lot to offer potential tourists. In addition to fishing and skin-diving in almost untouched waters, searching for war relics in the bush, and observing the Polynesian way of life in uncommercialised villages where visitors are treated as honoured guests, have obvious attractions. Tuvalu is off the beaten track in the truest sense of this well-worn expression, and, to use another cliché, the visitor must be prepared to 'rough it' as regards both transport and accommodation. However, it is well worth it.

The only link with the outside world is the weekly plane from Suva, which lands on the coral runway at Funafuti, built during the war. When not in use by the aircraft, the runway is used as a sporting ground, in particular for the Tuvaluan ballgame known as *te ano*, played with a pandanus-leaf ball. I won't attempt to describe the rules here.

None of the outer islands has an airstrip, and inter-island travel is exclusively by the ship *Nivanga* (meaning 'voyage'), which makes monthly or fortnightly round trips to most islands.

'Plane day' in Funafuti is a big event, when most of the population gathers along the airstrip to see who the new arrivals are, and say goodbye to departing friends. Most new arrivals get a mention over Radio Tuvalu on the same day. Otherwise, the national radio

carries mainly taped music, shipping news, politics, and signs off with the national anthem every evening at 7.30 pm.

The inter-island ship is a Tuvaluan institution, around which so much of the islands' life revolves. The ship has first and second class cabins, each with their own saloons, toilets, etc., but in the cramped space on board these colonial-relic distinctions are largely ignored. Most people travel by 'deck passage' anyway, which is certainly more comfortable than trying to go to sleep in the hot, stuffy cabins. Days are spent singing to the accompaniment of ukuleles under tarpaulins on deck, or trailing fishing lines after the boat. Sometimes sharks can be seen following in search of scraps. For the 'cabin' passengers, meals consist of beef and rice served in the saloon, but deck passengers mostly bring their own food, of the native variety.

On reaching an island, the *Nivanga* anchors off the reef, and is often met by people in outrigger canoes. When wind and tide are right, one of the two landing boats is lowered into the water, filled with passengers and their belongings, and then heads for the passage in the reef. Shooting the reef passage even under the best of conditions can be a tricky job, and despite the skill of the Tuvaluan sailors, a boat sometimes overturns, so everyone has to swim for it, and cargo is



Meleangi at Funafuti

recovered later as best as possible. Back at home in Funafuti, the ship anchors in the lagoon, but despite many problems plans for a deep-water jetty are still underway, so that the landing craft need not be used in Funafuti. Spending long quiet nights on deck under the stars, I managed to learn a bit about traditional Polynesian navigation from the sailors, such as interpreting winds, currents, stars, clouds and birds.

Each one of the former Ellice islands has a separate European discoverer, and there was little contact with the outside world until the arrival of missionaries in the 1860s. In the later years of the 19th century some of the islands suffered from raids by blackbirders, who took away a considerable part of the population. (On one island I was shown an area of red sand which tradition has it became that colour from the blood of a party of blackbirders killed

there 100 years ago.) This led to the islands being taken under British protection in the 1890s.

Since then their history has been uneventful, apart from an interlude during World War II when American forces occupied Funafuti, Nanumea and Nukulaelae, and built airstrips from which to engage the Japanese in Tarawa to the north. Older people have a lot of stories to tell about wartime events, and even today there are a lot of old aircraft parts in use as water-tanks, building materials, and racks for drying copra.

Tour of Oceania

The Australian Institute of International Affairs, New South Wales branch, is mounting a tour of Oceania from August 16 to September 7.

Those taking part will visit Papua New Guinea, Solomon Islands, New Hebrides and New Caledonia.

Tour leader Colonel D. M. Ramsay told PIM: 'Our aim is to stimulate further the good understanding between Australia and the countries to be visited.

'We have decided on a number of topics for study and discussion, including trade between countries in the region, relationships with neighbouring countries and with major powers, security and defence of the region, and the two hundred nautical mile exclusive economic zones.'

Colonel Ramsay may be contacted at 121 Edgecliff Road, Woollahra, 2025.



Unloading the landing craft at Nanumea Lagoon.

Dr. Marshall Laird
Whangaripo Valley Road
Rural Delivery #2
WELLSFORD
Northland
NEW ZEALAND

George H. Balazs
SW Fisheries Centre
Honolulu Lab. NMFC/NOAA
P.O. Box 3830, Honolulu
HAWAII 96812 USA

7 September 1984

Dear Dr. Balazs:

I should much appreciate receiving a copy of your "Sea turtles and their traditional usage in Tokelau" (ATOLL RES. BULL. 279, Dec. '83). I only had time to skim through a copy in the Biology library at Auckland University today, and besides finding the contents most interesting I recognized old friends in your photos. I first visited Nukunono and Atafu 31 years ago, had two extended trips to all three of the NZ atolls in 1958 and 1960, and was back briefly in 1980 to assess the long-term results of the biocontrol experiment that I had directed more than two decades earlier (for WHO).

After spending much of my post-World War II working life based away from the Pacific, I retired from Canada's Memorial University of Newfoundland late last year and my wife and I are now settled back in our native NZ. I'm devoting the greater part of my time to writing and editing books, one of which is to be a selected bibliography of the natural history of this country and its outlying island dependencies. Incidentally, I saw my first Melanesian-killed turtles while on active service in WWII, my most recent record concerning meat, eggs and congealed blood put up for sale (in a decided break with the past, that caused much furor among the villagers!) in 1983 on Nukulaelae, Tuvalu, while a (Tokelauan) medical epidemiologist and I were marooned there for a couple of fascinating weeks when the elderly Grumman Goose we'd arrived by broke down. The man concerned had gone over to one of the outer islets the night previously, and now there he was (he was no less than our local collaborator, the Sanitation Aide, too) selling aliquots at \$1.50 per bowl outside the island's only store.

Anyway, would my own entomological papers on the mosquito control research I've been associated with in Tokelau, interest you? Also, perhaps, a copy of that Wodzicki/Laird bird paper you cite, if you don't have an original reprint? If so, I could bring them with me in mid-December when I'll be up for a brief visit as a participant in a USDI (Fish & Wildlife) avian disease workshop, arranged by Ernest Kosaka. I could also show you some colour shots of what pre-aluminium-boat life was like in those lovely atolls, if a short meeting were practical. I don't know where I'll be staying yet - but Ernest Kosaka of USDI is arranging the details.

Looking forward to hearing from you,

Yours sincerely,

Marshall Laird

AIR MAIL

PAR AVION



AEROGramme



Dr. George H. Balazs

50 FISHERIES CENTER, HONOLULU LABORATORY

National Marine Fisheries Service, NOAA

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HEALTH AND MOSQUITO CONTROL IN TUVALU

1. Mosquitoes and where they come from

The mosquitoes that bite you are the adult stage of the wrigglers that you see in your water containers and pulaka pits. Some bite during the day, others at night time.

There are six different kinds of mosquitoes in Tuvalu. All of them are found on Funafuti, while fewer occur on some of the other islands.

Only the females bite, incidentally - the males take only nectar. After marrying and sucking your blood, the females lay their eggs. They do this on various kinds of water collections.

Some of these water collections are found around houses, for example, rainwater storage tanks, 44 gallon drums, discarded tins and jars, old rubber tyres and so on. Others collections are in areas used for growing food plants such as the pulaka pits and coconut groves. Water held in coconuts that have been pierced for drinking or chewed through by rats can be an important source of bush mosquitoes. Also important are holes made by crabs, the leaf-bases of fallen coconut leaves, holes rotted into trees, and the axils of plants such as pandanus, taro and coconut. In fact almost any collection of water which stands relatively undisturbed for a suitable period of time may become a breeding site for mosquitoes.

Whatever the kind of mosquito the development period from egg to larva to adult takes about one week. Although mosquitoes breed year round, heavy rains fill up the many usually - empty containers and females are able to find many new places to lay eggs. As a result the numbers of mosquitoes increases greatly and people begin to complain about being bitten. Since a female may live for a month or more, the results of a single heavy shower may persist long afterwards.

2. Mosquitoes and our health

Some mosquitoes are only important to us because of the annoyance they cause by biting. In Tuvalu, the "nuisance mosquitoes" which breed in pulaka pits, have purely night-biting females. It is these in particular that can make things so uncomfortable that you may need a mosquito net to get an untroubled night's sleep.

Other mosquitoes cause annoyance by biting during the day. The most prominent of this kind in Tuvalu are the black-and-white striped ones. There are two distinct kinds of these.

Both are very important in connection with health. One, the bush mosquito, is responsible for spread of the parasites, of filariasis (the disease which may end in elephantiasis, fuua) from people with these organisms in their blood, to new victims. The other is a "domestic" mosquito, called this because it breeds in and around the house. This second kind of black-and-white day-biter spreads the virus of dengue fever from person to person.

Filariasis is commonest on islands with unusually large numbers of black-and-white "bush mosquitoes". Those people affected suffer intermittent chills followed by profuse sweating. In the old days, before modern medical treatment was available, a long-term consequence of filariasis was the severe swelling-up of the limbs in the condition called elephantiasis. This was more often seen in Vaitupu (which still has unusually large numbers of "bush mosquitoes") than elsewhere. However, proper medical treatment of filariasis in its earlier stages prevents such serious end results nowadays.

Dengue is a different matter. A much more serious disease than filariasis, it is at present increasing in various South Pacific island groups. It starts off with very high fever and a severe headache, with acute pain around the eyes. A rash develops all over the body after the fever subsides, and the joints become painful. The fever and headache are over after three to five days, but the joint pains and weakness last for two to four weeks. In one of its forms, dengue leads to bleeding (both internally and through the nose, mouth, etc.). This "hemorrhagic" form is thought to follow earlier attacks of dengue and a few of those people attacked pass into a state of shock, and may die. There is no known treatment for the earlier symptoms of dengue, apart from the medical use of the pain-reliever paracetamol—not aspirin. At the shock stage of hemorrhagic dengue prompt medical treatment is absolutely essential to preserve life. Dengue is spread by the black-and-white mosquito which breeds in and near the villages. When it occurs it does so in epidemic form - 15 people are known to have suffered from the mild form of dengue in Tuvalu in 1980.

There is a third mosquito-carried disease at present spreading in the South Pacific. This is Ross River Fever. It is not yet fully understood which mosquitoes transmit it, and this disease has not yet been identified here in Tuvalu.

All three diseases are matters of much concern to international health authorities. The South Pacific Commission is currently particularly involved with measures aimed against both Dengue and Ross River Fevers. The concern led in 1981 to the testing of new kinds of mosquito control measures in Tuvalu (Funafuti, Vaitupu and Nukulaelae).

3. Controlling mosquitoes here in Tuvalu

Proper sanitation, with the full and enthusiastic involvement of entire communities, goes far towards reducing the numbers of mosquitoes. When at low levels these insects no longer constitute a serious nuisance nor are they prevalent enough to transmit diseases. This is particularly so for the two black-and-white mosquitoes of Tuvalu, the "domestic" transmitter of Dengue fever and the "bush" transmitter of filariasis. Unusually large numbers of these biting in the villages are generally a sign that people are being careless about the disposal of old tins, crockery, tyres etc. about the home. The cleanliness of coconut groves is also important where if pierced drinking nuts are simply thrown into the underbrush, and fallen fronds are not regularly cleared away, "bush" mosquitoes will take advantage of these breeding places.

Chemical insecticides effective against mosquitoes first became available during World War II. DDT was both effective in killing mosquito larvae and persisted for a long time, but is not now in general use since it has been shown to kill other insects and fish as well. Modern insecticides like Abate are both effective against mosquitoes and have no apparent long term effects on the environment. There is a growing tendency, however, not to add any chemical insecticides to human drinking water supplies. Instead, synthetic substances which do not kill mosquito larvae directly by poisoning them but which disrupt their growth so that adult mosquitoes are not produced, are being developed. One of these substances, called Altosid, was used in the 1981 Tuvalu mosquito control testing programme. Also used were two kinds of "biological control agents". These were mass-produced organisms of tiny size which occur as natural enemies of mosquitoes. These agents cause disease among mosquitoes but are perfectly safe to all other forms of life. There is now good reason to believe that these and similar new kinds of control agents will prove important as replacements for chemical insecticides. These new methods will add to the effectiveness of proper sanitation for controlling mosquito transmitted diseases.

4. Community participation in mosquito control

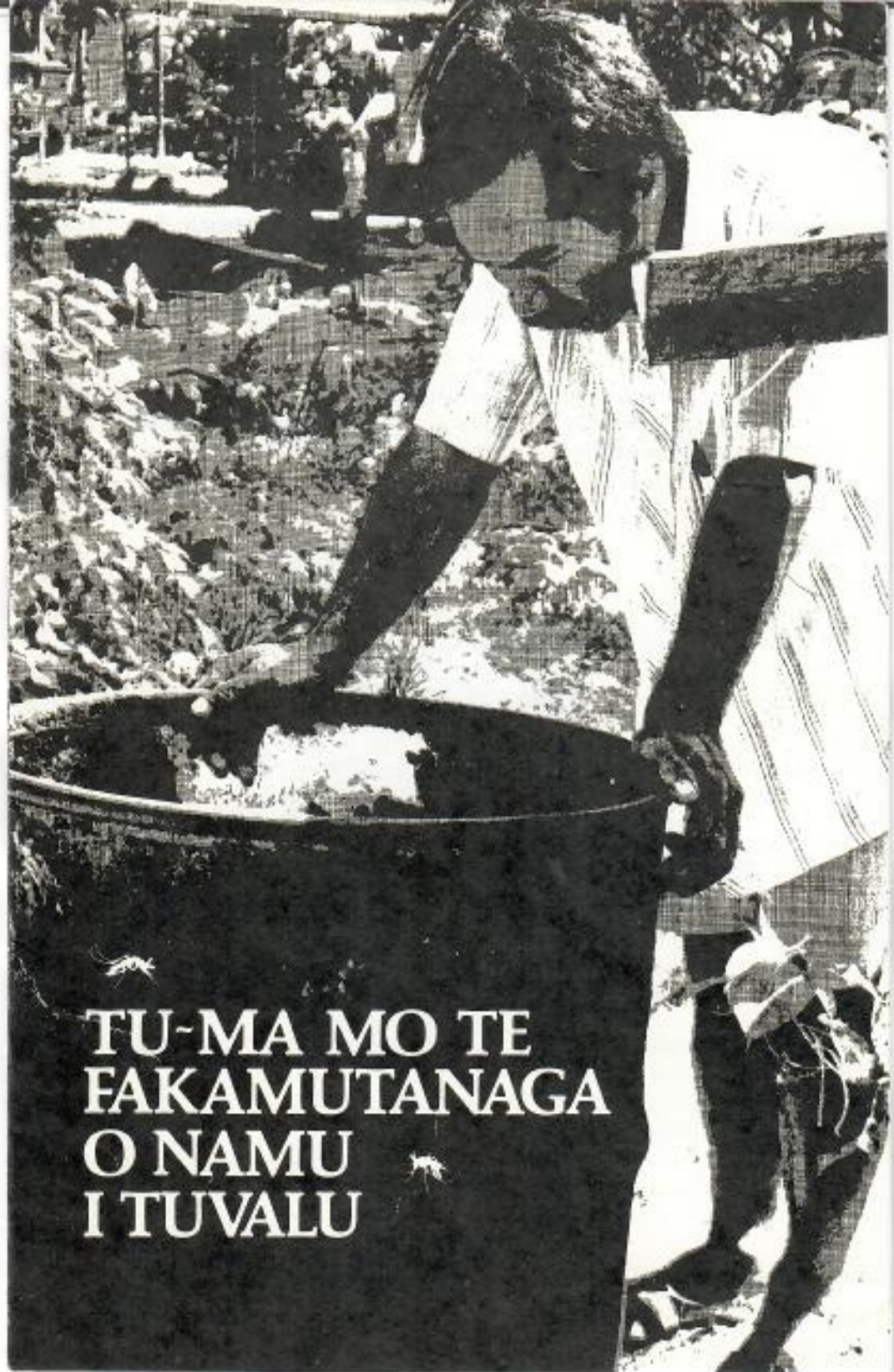
Without the fullest interest from the whole community, and the willing cooperation of the various action groups of the people, the Government's Health Inspector, Sanitation Aides and Medical Assistants are destined to have a difficult job in implementing adequate sanitation for mosquito control. These action groups include the Women's Clubs, the Boy Scouts and Girl Guides and Church groups. Other obvious organized groups who can play an important role in continuing anti-mosquito campaigns in Tuvalu range from the various schools, not forgetting the Maritime Training School, to the correctional institution - prisoners' rehabilitation can be well expressed in community work of this nature.

The specific kinds of anti-mosquito tasks to be undertaken by the community, are as much a matter for the decision of the Health Inspector as decisions on the precise treatment of mosquito-carried diseases are the responsibility of the medical profession. Some examples of such tasks are as follows:-

Never throw empty cans and bottles or old automobile tyres into the surroundings of houses - because black-and-white dengue-transmitting mosquitoes may breed in them.

- : Keep all grass and other vegetation cut back for at least 100 feet from occupied dwellings- because biting female mosquitoes rest in the protection of such plants.
- : Organize the collection and proper disposal of all water-holding cans, bottles and other rubbish in and around villages.
- : Proper disposal of cans and bottles implies first, squashing each can flat and pounding each bottle into fragments and second, the regular collecting of this material by your rubbish disposal teams for dumping at a government-approved place.
- : When you have pierced coconuts for drinking, or halved them for extracting the meat, always chop them into small pieces for collection by your rubbish disposal teams.

If coconut are so used on the unpopulated reef islets, gather them together and burn them. Because there is breeding in many such water - holding coconuts scattered through the bush of all Tuvalu village islets and unpopulated notu, it would be useful to organize intermittent collections from such destinations by e.g. Boy Scouts, Girl Guides on a competitive basis. These same competing teams could also usefully look for water-holding holes in trees (these breed many "bush" mosquitoes too) and fill them up with sand and coral chunks to dry them out.



TU-MA MO TE
FAKAMUTANAGA
O NAMU
I TUVALU

A namu mo koga e mafua mai ici

E tusa mo te ono vaega namu i Tuvalu nei, kae maua katoa a vaega e 6 konei i luga i Funafuti. A fenua i tua e mutana ifo a vaega namu e maua ici.

A namu konei e u ne latou tatou ko namu ne mapa mai i mota iloto i vai i tafa o tou fale io me ko mota iloto i vaipulaka. Nisi namu e u fua i ao, nisi e u i po. Ko namu fafine fua e u ako namu tagata mo



te namu fafine ma oti ne fakatasi, ko fano iei te namu fafine o inu ki toto o tagata, oti iei, ko fano o fanau i luga i vai.

A vai fakatali i tafa o fale pela mo vaisameni, 44 kalone tulamu atigi kapa mo atigi fagu, lapa o motoka mo nisi mea aka e maua o nofo iei a vai. Nisi koga foki e masani o tuku iei a fua o namu ko vaipulaka mo puuga i niu mo lakau aka, io me ko katiga feitu pi io me ko pi kaina ne kimoa. Te taulasiga o namu vao e fanau i vai kona. Nisi koga aka taua e fanau iei a namu ko pu o tupa, tafito o pokofa kola e piki ki te foitino ote niu, koga pala kola ko pu i lakau mo moe o lakau pela mo fala, pulaka, tamu mo talo. Te manatu pela ko vai katoa e se fakagasuesue e fanau iei a namu.

Te leva o taimi mai te fanauga a te namu, liu mota ke oko ki taimi matua tela ko eva iei e tusa mo se vaiaso e tasi. Seai ne taimi i tausaga e fakasino mo fanau a namu. E fanau valevale fua, kae fai pela me ko taimi e uke iei vaiua ko taimi u o namu. Te pogai ko koga fanau iei a namu fafine ko uke. Ko mafua iei te uke o namu o u a tino. A namu fafine e mafai o ola ki te leva e tusa me se masina e tasi.

A namu mo tou masaki?

Nisi namu e taua fua kiatatou me u. I Tuvalu nei namu kola e fanau i vaipulaka e u fua i po. Kolatou foki konei e u kati ma moe tatou ko pogai iei o fakaoga iei a tainamu i po.

Nisi namu konei e u i ao ko namu kola e pulepule kena. E lua vaega namu pulepule kena kona kae taua foki ki tino galue o te Fakaimasaki. E tasi ko te namu vao a koia tena tela e mafua mai iei te kiatolo mote fua. Ko te namu nei e u nei te tino kiatolo ko

fakapisi iei nei ki nisi tino. Sua namu ko te namu o fale. E fakaigoa ki te namu o fale me masani o fanau kae ola i tafa o fale. Te namu nei e fakapisi nei te masaki ko te Dengue Fever, mai tino ki sua tino. Te namu nei e u fua i ao.

Te masaki ko te kiatolo e taulasi i fenua kola e uke iei a namu vao io me ko namu kola e pulepule kena. I aso mua koituai o isi vaialakau e uke tino e maua sale ne te kiatolo fua kae nei ko isi ne vaialakau o fakagata te masaki nei. A Vaitupu ko te fenua e tasi ne lauiloa i te masaki ko te kiatolo mote fua (a namu pulepule kena io me ko namu ao koi uke loa nei iei). I aso nei ko se lasi te masaki ko te kiatolo, fua, me ko isi ne vaialakau o puipui tatou koi tuai o maua te masaki nei.



A namu masani o nofo mo tatou i tou fale.

Te tangi-ki (Dengue) se masaki foki e keke. Se masaki e tai masaki atu ki te fua, kae nei ko gasolosolo loa o lasi i fenua o te Vasa Pasefika. E kamata te masaki nei ki te maluga ote vela o te foitino mo te ulu mae, kae mae foki kogakoga i tafa o mata. E sae te kilii o tino e pokotia ne te Dengue mafai ko tai lei tena masaki kae olo tasi loa mo te mae o sokoga o tena foitino. Te vela mo te ulumae e feooloo i te 4-5 o aso, ako te mae o sokoga mo te fakamate ote foitino e aveave loa ki se leave e tusa mo te 2-4 vaiaso. I sua fanoga o te masaki ko te Dengue e mafai o fano te toto o tino iei; sali toto i pu-isu mo gutu io me pakia koga iloto ote foitino (internal bleeding). Te vaega Dengue nei (toto sali) e maua sale mafai ko oti koe ne poko sale ne te Dengue, a ko latou kola e pokotia e masani o soki (shock) kae ko mate iei. Seai se vailakau o fakagata te pokotia o tino i te masaki ko Dengue i tafa o vailakau konei e fakaoga o fesoasoani ki tino ki te mae pelaa mo Paracetamol kae se ko aspirin. Te fakamate o te foitino o tino mo te pakiaga i loto i tena foitino (internal bleeding) e tau loa o ave ki te Fakaimasaki ke maua se fesoasoani. Te masaki ko te Dengue e fakapisi ne te namu tenei pulepule kena kae masani o fanafanu pili fua ki fale mo koga pili ki te fakai. E masani o poko te masaki nei pela mese famai, kae tusa mote 15 tino ne poko i te famai nei ite 1980 i konei i Tuvalu.

Te tolu o namu aveave ne latou masaki ko te namu o te masaki ko te Ross River Fever, te masaki nei ko pisi foki sale i vasa o tatou Pasefika. Seki ai nei se mau kai iloa me ko te vaega namu fea tenei e fakapisi nei a te masaki nei. Nei seki iloa loa ke pokotia ikonei i Tuvalu.

A masaki katoa konei e tolu e taua ki ki mafaufau o tino o fakapotopotoga puiipuga masaki i te latolagi. Te fakapotopotoga ko te South Pacific Commission nei e taumafai o suesue ki auala o fakagata kae puiipui tou olaga mai masaki konei ko te Dengue mo te Ross River Fever. Tenei ko mafua iei o fai te suesuega o auala fou i te tamatega io me ko te fakamutanaga o namu i Tuvalu nei (Funafuti, Vaitupu mo Nukulaeiae).

Fakamutanaga o namu i Tuvalu

Te tausi o tulafono o Tu-Ma mo te loto tasi kae malosio o tino o fakai, fenua mo vasega e ui iei o maua o fakamutana te fua inumela o namu. Ka mutana te sofaki o namu, ka mafai o se lasi te pokotia o te fakapotopotoga ne masaki kona ne fakasi atu i luga kae ko se lasi foki te u o tino ne namu. A namu pulepule kena e tasi e masani o nofo i fale, koia tena e fakapisi ne ia te Dengue Fever a ko te namu vao fakapisi ne ia te kiatolo. Te uke o namu i fakai e fakailoa nei a se tausi ne tino tulafono o Tu-Ma, maua o fanau iei a namu ke seai ne mota iei. Te sona tiaki o toega o pi mo kaulama mo te se teu ke ma o te fakai e fakauke iei a namu vao.

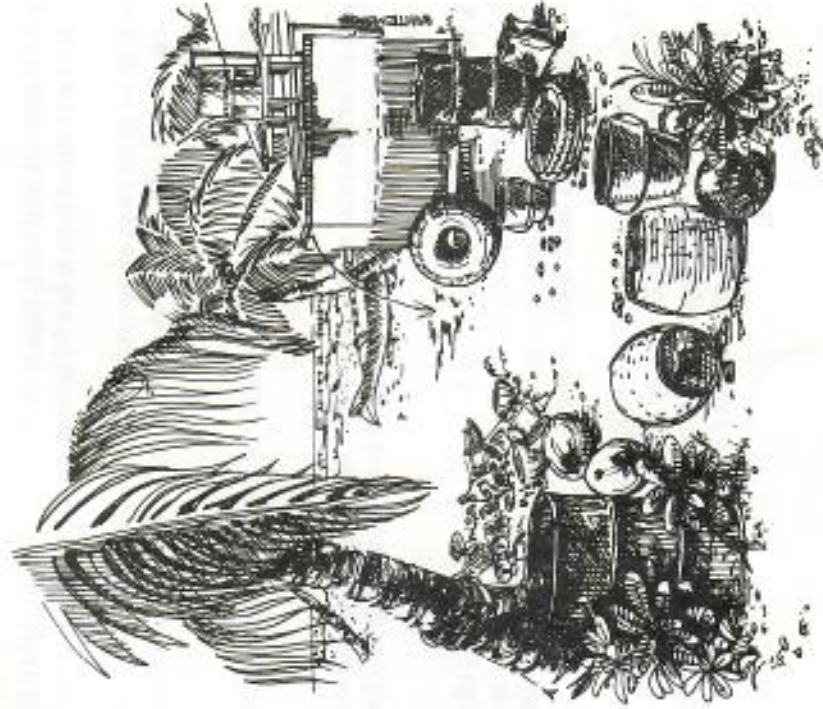


Teuga mo tausiga ke ma tou tafafale e fesoasoani o teke te masaki ko te Dengue.

A vaialakau sana namu ke mate ne maua fua i tua o taua ko teka. Te DDT se vaialakau poisini e tasi ne fakaoga malosii o ta a mota i vai kae leva foki tena malosii i vai kae ko se fakaoga malosii me te foki ne ia i nisi manu foliki pela foki mo ika. A vaialakau fou ne maua aka fakamasei nei pela mo te "Abate" ko oko loa i te lei me seai sena fakamaseiga ki tino io pela foki loa ki nisi mea ola aka. E isi ne mafaufauga ke seai ne vaialakau ke tuku ki vai inu ne tino. Ne maua te poto fou tela ko se fakaposini a mota a ko fakamasei te olaga o latou. Ko te iloa fou nei ko mota ka se liu namu a ko tupu masei ko mate iei. E tasi te vaialakau nei ko fakaoga i Tuvalu nei ko te Altosid, ne fakaoga i Tuvalu nei i te 1981 i te tofotofoga o fakamutanaga o namu. Ne fakaoga foki e lua vasega o poto i tamatega o namu. I te faiga o te polokalame ki fakamutanaga o namu. A mea e lua konei ko tama manu io me ne anufe foliki kae e fili kiei a namu. A manu foliki konei e fakamasaki ne laua a namu kae e seai se fakalavelave e tupu ki nisi mea ola aka. Ko isi nei se pogai o iloa me i iloa konei ka sui ne latou te poto ki te fakaogaga o vaialakau poisini (chemical insecticides). A poto mo te iloa fou konei mo te tauti ki Tu-Ma ka faopopo tasi ko te tina tali loa tena ki te fakamutanaga o namu fakapisi masaki.

Te fesoasoani ate fenua io me ko te fakai ki te fakamutanaga o namu

Ma seai se fesoasoani io me seai se loto fiafia o te fakapopotoga io me ko tino, o se fakai io me ko te fenua i ana vasega kasekese te ofisa o Tu-Ma (Health Inspector), tagata tu-ma o fenua (Sanitation Aide) io me ko te tulesa io me ko te nesi, ka faigata o fai a galuega ki te fakamutanaga o namu. A vasega pela mo komiti a fafine, sikauti, kaisi mo vasega a Lotu e mafai malosii ne latou o fakaoga olotou taimi ki te galuega ki te fakamutanaga o namu. Nisi vasega e se fakapuli i te mafai o maua foki se fesoasoani mai iei ki galuega kona ko akoga, te akoga kauvaka i Amatuku, pagota foki.



Mate aka me fia koga fanau o namu i te ata?

A nisi galuega aka ki te taga o namu e fakatonu tonu loa ne te ofisa o Tu-Ma me e a latou loa te kau o te fakaimasaki te galuega.

Nisi galuega e tau mo te fakamutanaga o namu konei:

- Se ti valevale atigi kapa, fagu io me ko lapa o motoka i tafa o fale, i namu pulepule kena kola e fakapisi ne latou te Dengue e fanau iei.
- Kati ke mutu mouku kae velevele ke ma a lakau (fala, futi, puka vai mo nisi lakau aka) ki se mao e tusa mo se 100 futu. Te pogai ko namu e fakalafi i koga pupupu.
- Fai galuega fakatasi i taega o atigi kapa, fagu, mo kaiga i tafa o te fakai.
- E sili ke faka pupu a kapa, a fagu ke fo, ako kaiga ke tae kae ave ki se koga e tasi e fakasino ne Fonopule io me ko te Malo ke ti kiei a kaiga.
- A pi ma kati io me ko feitu gati ke masau o fakapulou ki lalo io me kati ke foliki moa e maua ne vai iei i taimi to o vaiua io me fakatupu ke tae o tanu io me sunu ise koga e tasi. E tau fok i fai se galuega pena i motu foliki o fenua.
- Te uke o kaiga mo atigi kapa mo puga o lakau lasi i fakai io me ko vao e tau o tausi ke moa e isi ne vai e nofo iei. E maua o fai a galuega nei ne fakapototoga pela mo sikauti, kaisi mo komiti o fenua taki tasi. A vai e maua i puga o lakau e tau o tanu ki one mo kilikili.

Ne fakatoka mo te minisitule ote Tu-Ma mo fakaimasaki ote Tuvalu.

Ne tasi fakatokagata ne te IDRC mai Kanata.



Whangaripo Valley Road
Rural Delivery No.2
WELLSFORD
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4 October 1984

George H. Balazs
SW Fisheries Center
Honolulu Lab. NMFC/NOAA
P.O. Box 3830 HONOLULU
Hawaii 96812
USA

Dear George:

Sorry not to have responded earlier - "retirement" is proving busier than anticipated, what with writing, lecturing etc. obligations, and late-lamb 3 having had to be helped out ("I want back, they said this was the winterless north!") in a blinding rainstorm a few nights back, when the temperature dropped to around 1°C. Anyway, total survival down to lamb 4 currently hoping that our Black Orpington rooster is his Mum (somewhat bloodied, she's grazing and clearly trying to put the whole thing out of her mind).

Many thanks for your extremely interesting papers. I enjoyed reading all those sent with your 13 Sept. letter (thank you, US taxpayers!), which arrived so rapidly after my 7 Sept. epistle. I've sorted out some Tokelau shots that we could screen over Macadamia Nuts and whatever (as I understand it, your Macadamia bonanza is thanks to Queensland, Australia, where nobody ever offered me one nearly 4 decades ago when I was on my way up to the then-recently flattened Hiroshima). As promised, you'll have my Tokelau papers when we meet in December; meanwhile, though, if there's anything in the enclosed, updated, publ. list that would interest you, let me know; and copies will be provided then.

Turning to yours of 16 Sept., the info. you need is italicized below. And thanks for the CDC Newsletter included therewith. As of '84 I'm no stamp-collector. But before WWII I was, oddly enough specializing in early Canadian issues from NZ. Lately, I've sublimated by simply saving stamps with animal subjects, for a New York friend who sends me PUNCH in exchange. He's the only American I've ever known who respects this particular British magazine (jokes being as different as they are, even between friends), and as in my "retirement" I couldn't really justify a subscription anyway, the on-going exchange continuity is clearly necessary. So if you've turtle swaps that could be spared (your article was stimulating to a one-time collector who nowadays sublimates on 16th/18th century maps and books re biological history) I would much like to receive a selection to transmit to my friend (a recent subject of open-heart surgery). But, to revert to Nukulaelae, probably the loveliest little atoll in the tropical S. Pacific.

What actually happened was as follows. That Nukulaelae experience took place in 1982, not 1983. The seller of the remains of that *Chelonia mydas* (which was what the Nukulaelae beast was), was, as mentioned in my 7 Sept. letter, the local Sanitation Aide: were you to write to him, he probably wouldn't (couldn't) reply. But, were you to write to the Vice-President of the Village Council of Nukulaelae (my regards to him, please!), Liva Fousaga might well be able to winnow out the details - Liva F. is one of the few men alive who (as a forced labourer for the Japanese

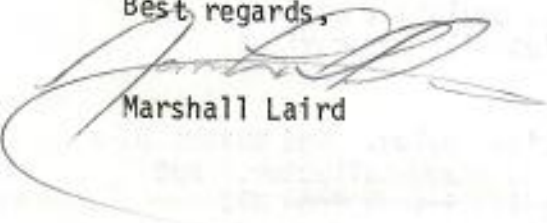
/P.T.O.

*As I was to spend some 20 years in Quebec (1957-61) and Newfoundland (1967-83)

occupation force on Tarawa) witnessed the US landings in 1943. To their credit, the Japanese removed his group to an isolated reef islet just before the main assault, in which the occupying force was virtually wiped out (not to their credit, they'd just executed a number of NZ and other assorted prisoners, including a marvellous old inter-island sailor of 80 or so who was damned if he was going to bow to anyone, a few days earlier). Anyway, you could ask Liva Fousaga about his feelings on that private sale of the turtle - as an individual he probably couldn't care less, as after Tarawa he finished up in administrative work on Ocean Island, formerly the nerve-centre of Britain's Gilbert and Ellice Islands Colony; as you'll know, since independence the Gilberts have become Kiribati (pronounced kiriba:tz, it's simply the Micronesian way of pronouncing "Gilberts", try it and see) and the Ellice Is., Tuvalu. But while his Ocean Id days probably weakened his personal feeling for atoll-dwelling practices, his current job as Vice-President of the Council of Elders for Nukulaelae would have caused him to hear all the comments made about the business enterprise of Fuatia Mataua, that atoll's Sanit. Aide. The latter killed his turtle and gathered in all its freshly-laid eggs on the night of 15 April, 1982. My stranded companion (Dr. Ropati Uili, a Tokelauan) and I were being housed in the village and fed by a different family each day until our Grumman Goose could be repaired in Fiji and fly back for us, and on the 16th our lunch of fried trevally (crevally, Caranx sp.), rice, fried breadfruit and boiled coconut embryo was garnished with lumps of congealed C.mydas blood (uncooked and tasting, well, different...). As to the reef islet where the turtle was killed, I don't have it recorded in my field note book (Fuatia never mentioned its name before Ropati and I were to have accompanied him so that I could take flash shots on the evening of the 15th, but in the event he sailed off alone, much to our annoyance, and he didn't want to talk about the matter again). I think I'll be able to make an educated guess when I can get my hands on the atoll's large-scale survey map, but this is currently in one of 20 or so unpacked 2cu ft cartons of papers in the loft of one of my barns, and I shan't have the time to search for it for a while yet. If you can obtain a copy of e.g. a US Navy map of Nukulaelae by the time we meet in December, I'll try to pinpoint the islet then.

I shall be looking forward to seeing your 45-min. show of Tokelau slides, and shall bring a good selection of my own with me.

Best regards,



Marshall Laird

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23 October 1984

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Dear George:

Further to my letter of the 4th, having now had full programme information on the avian disease workshop that Ernest Kosaka is organizing, I've decided to stay on at my own expense for a short time after the meeting ends. Instead of flying back home on 15 December I'll thus check out of the Ala Moana Hotel and into something cheaper (any suggestions? - the airline people here only deal with the obvious tourist hotels) until heading back on the night of the 17th. Actually, I can use a couple of days in the Bishop Museum library in connection with the bibliography of NZ natural history that I'm working on, of which more when we meet.

In haste and with good wishes,

Yours,


Marshall Laird

SEA TURTLES - TUVALU