

TALES OF PAPUA NEW GUINEA, 1974

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TO BOUGAINVILLE, VIA THE TROBRIAND ISLANDS

It was Saturday afternoon, and I was sitting in a medium-sized airplane on the runway in Port Moresby. The flight was full, mainly of Australians returning from vacation to their jobs at the copper mine on the island of Bougainville. I was travelling for a different reason; I had arranged with the mine staff to spend six weeks sampling the copper deposit. I was a doctoral student at the University of Tasmania, and the observations and specimens I would amass during the coming weeks would form the basis of my dissertation research. In retrospect, I was about to undertake a piece of work that would set the course of the rest of my life. What if nothing interesting would come of it? But such thoughts were not high on my agenda that day, as I ventured out to an exotic place, armed with my geological training and with the delight I took in observing the detail of nature.

The flight took us northeast from Port Moresby, over the Owen Stanley Ranges. In half an hour, we crossed over the notorious Kokoda Trail, site of a battle that halted the landward advance of the Japanese army in World War II. From there, the flight path led out over the Solomon Sea, a blue expanse dotted with turquoise atolls. Saturday flights included a brief stop at Losuia in the Trobriand Islands, a small and isolated archipelago. Losuia airport consisted of a dirt airstrip with a tin shed and a chicken-wire fence. Climbing out, I noticed six men behind the fence, each holding a wooden carving. The first five men were offering very handsome pieces in polished black wood, each shaped as though carved from a board about an inch thick, with tiers of figures, some human and some animal. The animals were pairs of copulating pigs, an invocation of wealth in those parts. The carvings proved to be the finest work I would see anywhere in Papua New Guinea. The price was \$15 (Australian money) each, a bargain, even in 1970s dollars. But my dollars were student dollars, and I felt uneasy at parting with fifteen of them on my first day. So I walked along to the man at the end of the line; he seemed rather shamefaced to me, and was holding a smaller carving of polished brown wood, this one depicting just the pigs. "*Em i haumas?*" I asked. "*Tu dola*" he replied. I gave him the two dollars, wrapped the pigs discreetly in my cloth hat, and resumed my seat in the plane. An hour or so later we landed in Kieta, on the island of Bougainville.

I should digress here and say that "Boganvil" is the accepted Australian pronunciation of the island's name, whether Francophiles like it or not. Admiral Louis Antoine de Bougainville, an aristocrat who survived the French revolution, commanded one of the French scientific voyages that circled the globe after the revolution, and left his name in many places. In addition to Bougainville in the Solomon Islands, there's a Cape Bougainville in Tasmania, an Isla Bougainville in the Falkland Islands, and the *Bougainvillea*, a plant native to the American tropics, but scarcely grown at all on the Bougainville Island I visited.



Losuia airport, with men selling carvings

I found my way on to a bus to Loloho, the port town for the copper mine. My instructions were to locate the manager of the single men's quarters. The manager placed me in a vacant hut, and gave me meal tickets for the rest of the weekend. On Monday, I could continue to Panguna, the mine town in the mountains. In the mean time, I had a free Sunday to enjoy my first tropical island beach.

I still have the pigs, which sit almost unnoticed these days in our living room in Tucson. In a letter to my family, I proposed them as a gift to my grandmother, imagining them sitting on the mantel piece of her lounge room, with her group of card-ladies gathered for their weekly meeting. She declined, politely but unequivocally, and I've been stuck with them ever since.

PANGUNA—THE TOWN

In building the copper mine on Bougainville Island, the Conzinc Riotinto Mining Company had displaced a village called Panguna, or Pumpkuna. Australianized to Panguna, this became the name of the mine and the new mining town, which was home to the single male employees and to a few married employees without children. There was no school in Panguna, so families with children were housed at Arawa, a town on the east coast. Those workers travelled to and from work each day by company bus,

about an hour's ride along a winding paved road that crossed a 3000 foot pass just northeast of the mine.

Panguna was about four years old when I arrived. The town had a supermarket, a post office, a bank and a medical center. In the single men's area were a large mess hall and a picture theatre, along with the living quarters themselves, several rows of joined prefabricated huts. The best part of town consisted of a set of houses along Kawerong Creek, where there was greenery, and residents had rudimentary flower gardens.

On my arrival, I was given a room in the single men's quarters, and a book of meal tickets. The tickets were good at the nearby mess hall, where I would be eating for the next six weeks while I undertook my doctoral field research.

Around 5 p.m. I reported to the mess hall for dinner. My first impressions were striking indeed. First, the room was huge, with dozens of tables, each seating twelve to fifteen men. Second, the seating was arranged by skin color. In the corner by the kitchen were the white Australians and New Zealanders, and a few Maoris. In the farthest corner were the Bougainville and Buka men, the blackest people I'd ever seen. In between, I saw just about every shade of brown, one uniform shade per table; these were the men from the New Guinea mainland and other islands of Papua New Guinea. This looked like a community in which trust was limited to groups of *wantoks* – those who shared a common first language. I felt uneasy about the color segregation system; would I have any choice but to toe the social line?

Because my stay in Panguna would be limited, I soon decided that I could afford to break the "rules". One evening I took my dinner into the far corner of the hall and introduced myself to the members of a Bougainville group. Of course I could sit with them, they said, and some of them stayed to talk for almost two hours after finishing dinner. With succeeding visits, I became a lot better at explaining in Pidgin English what a university student did, and what my father's sheep farm in Tasmania was like. And, most important, I experienced a generous response from people who might well have had little reason to trust me. The generosity eventually extended beyond the mess hall to a weekend invitation to visit one man's relatives at Arawa on the coast.

The food at the mess hall was generally excellent, standard Australian in style, and prepared by foreign staff. I imagine that it would have been impossible to recruit New Guinea cooks capable of running a kitchen serving hundreds of meals in those days. The only concession to tropical island sustenance came at breakfast, when a sumptuous table of tropical fruits (alongside bowls of malaria pills) was provided. The fruit may not have been grown on Bougainville, however, or even in PNG. The only agriculture I saw on Bougainville, apart from the slash-and-burn traditional style, was in the form of coconut plantations along the coast. As occupying troops discovered in World War II, the island's food resources were then, and most likely still are, just sufficient to feed the indigenous population. The food seemed perfectly tasty to me, but I now wonder how the Melanesian people liked it. My friend Gabriel who had grown up in the Sepik Valley in the center of New Guinea entertained me with stories of catching river fish and crocodiles and erecting nets to trap flying foxes in his home village in his home

village. No doubt the meat was an occasional supplement to a vegetable diet of taro, yams, sago and bananas. He didn't ever tell me how he felt about the company mess hall food.

My impression of the white community in Panguna was generally dismal. They were there to perform various technical functions that the Melanesian men had not yet been trained to carry out. In general, they regarded Bougainville as a hardship posting, and were only putting up with it to make money. They had little appreciation of the beauty of the tropical island, and, as suggested by the arrangement of the mess hall, almost no interest in social life outside their group. Some of the geologists had a more expansive attitude to the island. In the single men's quarters, there was little social life beyond meals, drinking and the company picture theatre. There seemed virtually no possibility of interaction with women, a situation recorded in plaintive graffiti by an earlier resident on the inside of the door of my room at the quarters. If there was no overtime at the weekends, the Australian blue-collar men I came to know would remain in their quarters and...well, sulk isn't too strong a word for it. Some of the professional men put together a running club, and I was invited to go along. This activity didn't turn out to be as innocent as one might have imagined. As we ran through the eastern side of the town, we met with another running group comprising New Guinea men. The New Guinea men clearly wanted to be included in the white group, but were shunned by it. The white group seemed to have become (whether by design or by accident I wasn't sure) an openly flaunted symbol of social separation, like an Orangemen's parade in Derry. I didn't attend a second time.



Pictures of Panguna: the shopping centre, the picture theatre, the road to Panguna

I came to know two Australian blue-collar workers, Fred and Ian, quite well. One Sunday, I convinced them to spend their free time with me on a walk in the jungle. The region receives about 250 inches of rain in a year, more than enough to grow a lush jungle vegetation. We went on a track that led out of Panguna along Kawerong Creek, and soon found ourselves in mountainous jungle with beautiful cascading streams. There was little to fear from animals, as far as I had heard. Most of the mammals on the island are marsupials, and none is large enough to be threatening. Rumour had it that there were no poisonous land snakes. What we found was a verdant paradise of large trees encrusted with epiphytes and lianas, and an understorey of ferns, small palms including banana plants, shrubs and moss. Some of the smaller vines and herbaceous plants were already familiar to me as cultivated plants in Australia – impatiens, for instance. I was keen to find some tropical orchids, but saw only a few. They grew high up on the trees, and were available on the ground only after the wind had dislodged them. Along the way, we discussed stories about finding relics, helmets, guns and the like, of the Japanese occupation. It was said that some of the Japanese had fled into the jungle, where they were eventually hunted down for bounty payments by the local residents after Allied forces reoccupied the island. The Bougainville people, by that stage of the war, had little love left for the Japanese, because competition for food had become intense and deadly once naval supply lines were efficiently blockaded. We saw no wartime relics; the Panguna area was probably far more remote from the coast than fleeing soldiers were likely to have ventured. The outing was a wonderful day for all three of us. The tropical experience was made complete when we all got drenched by the usual afternoon downpour.

I took my two friends on another weekend outing, to the coast this time. It was easy to get there and back by bus. We managed to convince the driver to let us off between Arawa and Kieta, where there were some Melanesian villages. We spent the morning swimming and playing with some local children on a small beach of black sand fringed with coconut palms. The children were greatly amused by our game of throwing a small palm fruit (not a coconut) to each other in the water, especially when Ian emerged from a dive and was accidentally hit on the head. Ian asked me to see if the children would climb up to pick a coconut and sell it to us for a snack. The children explained politely that those coconut palms didn't belong to them – and that made an interesting lesson in what we as foreigners didn't see in the way of local ownership and organization in a place that didn't appear to us to be arranged into units of property.

The Bougainville men couldn't do much about the presence and operation of the mine – such decisions had been taken away from them by the PNG government (effectively the Australian administration, because independence was still a year away for PNG). But they were keenly aware of the environmental toll of the project, and could observe who was doing what at an individual level. My first hint of this came from conversation over dinner. I discovered that I had been noticed as an outsider. Some of the men I'd been talking to worked in the open pit, and after a week or two, they had decided that I wasn't acting like a geologist, an engineer or any of the other Australians they might see there. The general unhappiness over the mine, growing from some of the problems I could already witness in 1974, and exacerbated by the small economic return that Bougainville was receiving from the project, festered through the 1980s and led eventually to armed uprising and closure of the mine.

Years later, Brian Bond, one of my former graduate students from the University of Arizona, was sent to Bougainville by a small mining company to investigate whether a mining operation could be re-started. He told me of negotiating with a man he called the “king” or local leader of Bougainville, who was interested in dealing with a smaller mining company (much smaller than the multinational giant Riotinto) over which the local population could retain some influence. Brian mentioned his connection with me, and the leader responded by claiming to remember me. At the time, I thought he was just being polite to Brian; I couldn’t imagine my brief presence as significant enough to have made any lasting impression on the local people, given all the damage that was occurring. On the other hand, perhaps they were watching me more closely than I realized!

PANGUNA MINE

The Panguna copper deposit in the middle of Bougainville, just west of the crest of the steep-sided mountain spine that runs the length of the island. The mine in late 1974 was already a large open pit, measuring almost a mile from the haulage-road entrance to the far wall, and several hundred feet from its floor to the highest benches. The jungle that had been cleared from the mine area was ready to move right back in should any area remain undisturbed for too long. I remember a pile of rock on an upper bench where no earthmovers had been since the first days of excavation; the pile was already sprouting twelve-foot saplings.

The ore was broken up by blasting, then a number of large mechanical shovels would transfer the ore into a fleet of 100-ton Euclid trucks. The trucks ferried the ore to the crusher, just north of the road entrance, and from there the crushed rock passed by conveyor belt to the flotation mill. The final product of the mill was a slurry of copper-iron sulfides that was pumped through a pipeline to the coast for shipping.



View of Panguna from mountain to the south



View from my single men’s quarters room

For my first few days working in the open pit, it was quite un-nerving to be too close to a hundred-ton truck rumbling past, but even more so to be near the single 200-ton truck the company was testing. It sounded like an airliner coming in to land. Driving the trucks was the most prestigious employment at the mine in the eyes of the New Guinea men. Most were new to driving; up until the development of the mine, most would have had some difficulty locating a job that could pay generously enough to finance a car. Many were tempted to be speed demons, whether in their own cars or in the mine trucks. Driving the trucks too fast must have been something like galloping an elephant, and could be dangerous in an open pit with sheer drops and any number of obstacles. Those who couldn't control the temptation were soon transferred to other tasks.

My assignment was to examine the whole deposit, bench by bench, mapping and sampling the vein types and working out the order of events in each place. I would begin as early as I could obtain a ride into the pit. (While waiting in the office for my ride, I would coat my exposed skin with sunscreen. The equatorial sun was capable of burning me painfully in about twenty minutes. *"I no gat bikpela san long Tasmania"*? asked a very black Bougainville man who had apparently never before seen a white man do that. *"I no gat"*, I answered; there is no strong sun in Tasmania). Everyone had to be out of the pit at noon, when blasting was scheduled. In fact, noon was usually the end of my field work for the day. About 12:30, there would be heavy to torrential rain most days. My visit was during October and November, the months considered to be transitional between wet and dry seasons in a place that received 200 inches of rain per year. I could only speculate about what the rain must have been like at other times. Even if the rain cleared up, I was not at ease in the open pit afterwards. Rock loosened by the noon blasting and lubricated by the rainwater would still be falling from the bench faces, so that concentrating on the geology would be difficult. If I wanted to do something useful after the rain, the best idea was to look at the rocks exposed along roads beyond the edge of the open pit.



The Panguna Open Pit, October 1974

Panguna, although only four years old, was already showing signs of some problems that would lead to its demise in the 1980s. I've mentioned some social problems in a separate story. The alienation of land was not limited to the mine area; there were also the port at Loloho, an extensive town at Arawa, and an expanded airport at Kieta, along with the various access roads. Furthermore, copper mines like that at Panguna produce vast volumes of fine-grained waste, because the ore is low-grade, consisting of grains of copper-iron sulfide disseminated through rock containing mainly worthless silicate minerals. The ore is first finely crushed, and made into a muddy slurry. The copper, along with a generous portion of gold, is separated out in a flotation mill. A chemical (xanthate) is added to the slurry, and air is pumped in at the bottom of each flotation cell. The xanthate modifies the surface properties of the copper-iron sulfides so that they repel water and adhere to the bubbles. When first developed, the technology was revolutionary; it hadn't been possible to mine large, relatively low-grade deposits like that at Panguna before flotation mills were invented. Given that the average ore grade was around 1% copper, the flotation mill produced a vast volume of valueless tailings in the form of mud and sand. The tailings contained more-or-less unreactive minerals like quartz, feldspar and mica, and also reactive ones like pyrite, sphalerite, galena and molybdenite (the sulfides of iron, zinc, lead and molybdenum). Tailings dams were not practical on the steep and shaky mountainsides near the mine, so the solution was to discharge them into the headwaters of the Jaba River, which in 1974 had already become a muddy drain smelling of xanthate. From Panguna, the river carried the tailings down to the extensive flatlands along the west coast of Bougainville, where they were deposited in the flood plain of the river and are visible to the present day in satellite images. They remain unvegetated to this day, despite the tendency of plants to grow rapidly over everything except sheer cliffs on Bougainville. The mining company had claimed that the new river flats would eventually become grasslands for the grazing of cattle. I doubt that the local people had ever understood what might happen to their land.

The Panguna deposit was rich. Low copper grades notwithstanding, the flotation mill produced copper concentrate economically, and the concentrate was rumored to contain sufficient gold to cover the costs of extraction of the copper. I once asked to see a gold assay map of the deposit, and was told that none existed – a curious situation in a mine where the gold was of such importance. I left with the impression that the company did not wish the PNG government to understand just how rapidly it was making money. The mining operation clearly had its local political difficulties, and the company directors must have reasoned that they should gather as much return on their investment as they could before relationships became difficult.

The company was also uneasy over divulging anything about the extent of other copper resources within a few miles of the mine. The old geological literature mentioned a small mine, probably dating from the 1920s, at a village called Kupei, and one company geologist had told me of a recent campaign of diamond drilling in the area. Kupei could be reached on foot from Panguna in half a morning, so I decided to go and have a look. There was a track along Kawerong Creek, and a small village at the end. I did my best to describe a diamond drill rig ("*masin i wokim liklik hul long graun*") to the villagers, and asked them if they knew where it was. One of them kindly took me for a walk through the jungle, passing some recently-discarded drill core and the old battery (the ore crusher) left from the former mine. Then we arrived at a clear rock face, from which I chipped a couple of samples of quartz-bornite veins from an outcrop as rich as any I had seen in the Panguna mine. What I saw didn't in any way

establish the size and grade of the Kupei deposit, but the reaction of the company geologists seemed to hint at something substantial. They must have thought that I would never find my way there, because they let me set out without comment, and were surprised later that day when I told them I had been to Kupei. This breach of security was dealt with later; once I had finished my field work, the company offered to ship my samples to Hobart. The box of rocks arrived in due course, having been re-packed, and the only missing samples were the ones I had labeled with the name “Kupei”. It wasn’t worth making any fuss about, because I already had material for what would turn into a fine doctoral research project, and the mining company had been very good to me. In the end, I learned as much about company politics as geology from my outing to Kupei.



My guide at the Kupei outcrop.

GETTING TO KNOW THE OREBODY

It’s possible to do all the reading in the world about a topic like porphyry copper deposits, but still only begin learning about them – or a particular example – the day one walks into the open pit for the first time. I’ve often had the experience of understanding the reading properly only after looking at actual rocks. In the case of the Panguna deposit, I knew I would find the copper associated with certain quartz veins with borders of biotite mica. From that point on I was in new territory.

It soon became clear that there was a record of a complicated series of events in the various small granitic intrusions and in what seemed a multitude of vein types. Just considering the quartz veins with the chalcopyrite (CuFeS_2): should I distinguish the more massive type from

the kind with a central opening sometimes peppered with small, loose quartz crystals, and those swarming around the small Leucocratic Quartz Diorite (lqD) stock from lower-density veins elsewhere in the pit, especially veins cutting the larger, effectively barren, Biotite Granodiorite stock? What about other distinctive kinds of vein – the single thick quartz vein bearing bornite (Cu_5FeS_4) next to the lqD; thin fracture-coatings, some patchy, of chalcopyrite with or without molybdenite (MoS_2); pyrite (FeS_2) veins with pale margins of white mica; veins of quartz and pyrite or marcasite; veins containing pale purple anhydrite (CaSO_4) that could only be seen in drill core because groundwater had dissolved the anhydrite away at the elevation of the open pit; veins containing quartz with sphalerite (ZnS), galena (PbS) and pyrite that could be found here and there within the deposit and also far from the open pit; veins containing the zeolite chabazite ($(\text{Ca}, \text{Na}_2, \text{K}_2, \text{Mg})\text{Al}_2\text{Si}_4\text{O}_{12} \cdot 6\text{H}_2\text{O}$) that occurred only around the fringe of the pit? Then what about the pebble dykes? These were sheets, up to a few meters thick, containing rounded pieces of the local andesite host-rock in a clay-like matrix of ground-up rock. Finally, there were scattered, irregular bodies of intrusive breccia containing angular chunks of the local wall-rock set in a matrix of either solidified magma or coarse crystals of hydrothermal minerals including potash feldspar, quartz and apatite. It was in these breccias, towards the top of the deposit, that the only oxidized copper minerals formed as a result of weathering could be found. Erosion was stripping the deposit so rapidly that almost no weathered zone survived, except where rainwater could penetrate deep into the breccias. In the wet tropical climate, diopside ($\text{CuSiO}_3 \cdot \text{H}_2\text{O}$) and cuprite (Cu_2O) seemed to be the typical oxidized copper minerals, rather than the malachite, azurite and chrysocolla of desert and temperate places. In one spot, where there had presumably been a concentration of apatite, the weathering had left behind fracture-coatings of shiny blue-green vivianite ($\text{Fe}_3(\text{PO}_4)_2 \cdot 8(\text{H}_2\text{O})$).

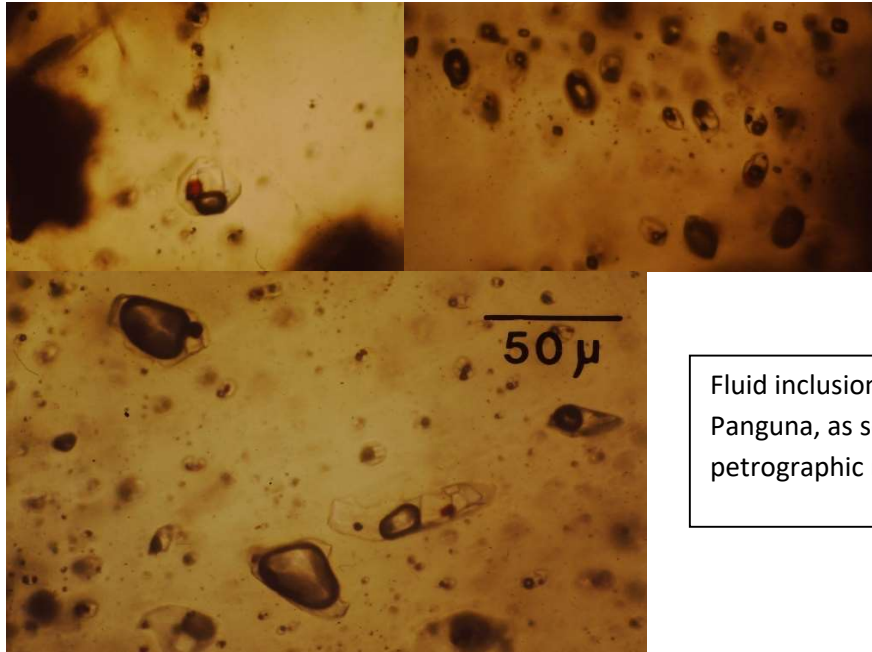
My task when confronted with such richness of detail was to try to work out the sequence of events. Only by understanding the development of the deposit in time could I hope to collect a useful set of samples. I was far from the university, and could count on only one chance to get it right. So I worked on one level of the pit each morning, moving from point to point, trying to judge how many such sites I could examine in the six weeks I would spend in Panguna. At each stop I would make notes about the types of veins and their cross-cutting relationships, and collect representative specimens that I thought might allow me to examine fluid inclusions, tiny cavities in the vein minerals, filled with fluids of different kinds.

Answers to many of the questions would emerge only with time. The fracture coatings, quartz-pyrite and pyrite veins turned out to form thin elliptical haloes around the lqD, a complete surprise, something I could see only after I had made maps of the distribution of vein types across the whole open pit. Those haloes turned out to be an important part of the

understanding I would eventually arrive at. Other answers developed only after years of laboratory work.

My specimens were eventually prepared as doubly-polished plates of quartz up to 1 mm thick. Fluid inclusions 10 to 100 microns long in the center of the slabs stood a good chance of surviving the cutting and polishing without fracturing. Looking at the fluid inclusions under the microscope revealed a new wealth of very aesthetic detail of the deposit. I never tired of looking at the inclusions in the copper-bearing quartz veins. At their peak of perfection, all too rarely achieved, the salt-rich kind were microscopic marvels, collections of near-perfect geometric forms. The cavity itself would take the form of a quartz crystal, a hexagonal prism capped at each end with a six-sided pyramid. Within, I would find a dark sphere (the gas bubble formed as the cavity contents contracted on cooling), a well-formed cube of halite standing out against the liquid phase in high relief, a more rounded cube, lower in relief, of sylvite, a box-shaped crystal of anhydrite, a blood-red hexagonal flake of hematite and a more-or-less tetrahedral opaque crystal of chalcopyrite that would appear as a black diamond or triangle, depending on the angle of view. Some inclusions contained several more small crystals, some colored yellowish and probably consisting of a sodium-iron salt. These salt-rich fluid inclusions represented a boiling liquid, containing at least 50% and as much as 70% salt, that had invaded the deposit at a temperature of 400 to 600° C. Interspersed with them were fluid inclusions consisting mostly of vapor, and a third kind consisting simply of liquid with a vapor bubble.

Very few outside researchers had been allowed to spend so much time – six weeks in my case – looking at the details of a porphyry copper deposit. Bernard Poty, in whose laboratory I eventually made most of my fluid inclusion measurements, said that most students would be given a day or two at working mines in Arizona. The detail I was able to record made all the difference; the deposit was complex, but it was possible to sort out many of the stages of ore formation. Perhaps I could have done a better job if I'd gone back for a second look after thinking about the deposit for a couple of years, but that didn't happen, and I had quite enough problems to chew on.



Fluid inclusions in quartz from Panguna, as seen through the petrographic microscope.

WEEKENDS AT LOLOHO

I spent my first two nights on Bougainville in a pre-fabricated hut, part of the single men's quarters at Loloho, situated on a portion of the coast taken over by the Bougainville Copper Company for the development of a port. It was at the downstream end of a pipeline through which the slurry of copper and gold from the mine arrived from the mountains to be turned into solid pellets for shipping. Some of the land had been a coconut plantation. The palms were still there, and the prefabricated huts of the quarters were nestled among the tapering trunks, along with a mess hall and a beer garden.

Bougainville is one of the shakier places on Earth, and it staged a small earthquake to welcome me on that first night. The sudden sideways wrench was disconcerting, but a metal prefabricated hut was clearly a safe place to be. Far more distressing was being jolted from sleep by the sound of a heavy object hitting the tin roof of a nearby hut in the small hours. If the coconut had landed on my roof, I think I might have died of fright!

I arrived at Loloho with the name of a contact, Gabriel Wintawa, a man from the Sepik Valley of New Guinea. As part of my preparation for the trip, I had taught myself *Tok Pisin* -- New Guinea Pidgin English -- as much as one can from books. Professor Carey, the Chairman of the Geology Department in Tasmania, had spoken Pidgin English while working as a geologist in New Guinea in the heroic days of the 1930s, and had plenty of resources to offer me, including copies of *Wantok Niuspepa*, published in Pidgin in the mainland town of Wewak. Well before leaving on the trip, I wrote a letter to the newspaper, seeking pen-friends to correspond in Pidgin. Gabriel was one of a hundred people from all over Papua New Guinea who responded. He worked for Bougainville Copper as a bus driver, and lived at

Loloho. He invited me to spend some weekends at the beach. I managed to do that twice, and he would drive me down to the coast in his bus, to the accompaniment of his favourite Slim Dusty tape. I remember him as a safe driver, which is why he had kept, his job. Not all of the New Guinea employees handled vehicles as well as he did. However, if he saw an invasive cane toad on the bitumen, he would aim a tire at it, and we would hear the “pop” from inside the bus. He enjoyed the Loloho beer garden very much, and I spent a delightful tropical evening there with him and his friends.

One friend decided that I should try betel nut, a palm fruit that people chew as a mild intoxicant in Papua New Guinea, India and parts in between. PNG people use three ingredients: *buai*, *kambang* and *daka*. *Buai* is the ellipsoidal betel nut. You bite off a piece, then take a *daka*, which is a dark green, finger-shaped palm fruit of a different species, dip it in *kambang*, white lime powder, bite the powdered end off and chew the lot up together. The mixture turns brick red. One look at my stained teeth in the bathroom mirror and I was finished with the experiment; fortunately the mixture washed off fairly easily. All over Papua New Guinea you see reddish splotches on the ground where men have spat out spent betel nut. It’s truly a filthy habit, leading people to post signs that say “*Itambu long kaikai buai*” (Eating betel prohibited) wherever they want to keep their streets and floors clean.

What I remember most vividly about Gabriel is my introduction to coral reefs. These must have been just as much a novelty to him as to me, because the Sepik people live in a swampy river valley far inland in the northern part of New Guinea. Gabriel liked swimming among the coral, and he took me along twice. At first light, when the water was calmest, we would walk a couple of hundred yards north of Loloho to a beautiful sandy beach between rocky headlands. The beige sand, a contrast with the grey volcanic sand of many Bougainville beaches, signaled the presence of coral offshore. Just how far offshore was a point of confusion to me on our first outing. I could see large breakers at the barrier reef two or three miles offshore, and I was puzzled at how we would get there without a boat. The only equipment we had was goggles. It turned out that there was a smaller fringing reef, harder to recognize from the shore, about 150 yards out. The water there was about four feet deep in the channels between the stands of staghorn coral, and at least twenty feet at the deep-water edge. So all we had to do was wade out to the fringing reef.

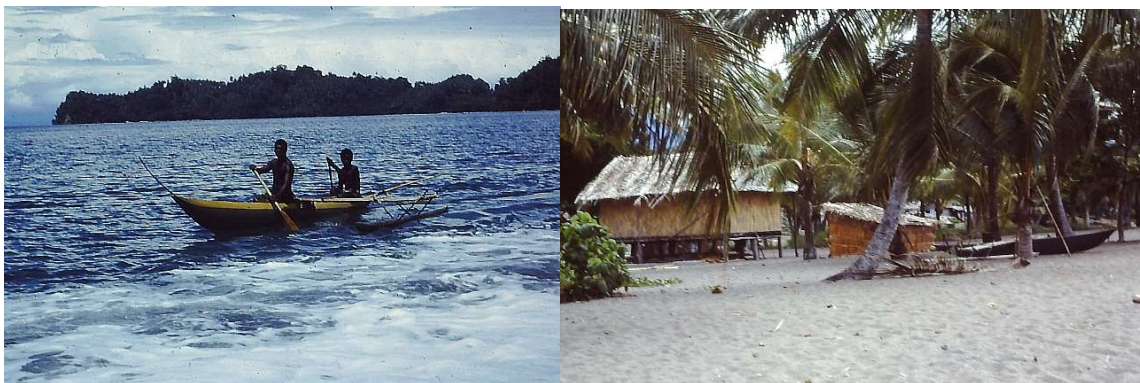
At that point, the Great Barrier Reef post-cards I’d received as a child and my university lessons on carbonate sedimentology came to life as a reality that far surpassed my imaginings. To reach the coral, we crossed a carbonate mud-flat festooned with patches of bright green sea-grass. Echinoderms rule that territory. Brown sea cucumbers patrol the clearer areas in the company of large starfish, some bright blue, and others parti-colored in brown, red and off-white. A few creatures fixed to stalks resembled the crinoids of my palaeontology classes. The mud-flat echinoderms set the tone for the day, and once I reached the coral I spent most of my time admiring the completely different set of echinoderms that inhabit the reef. Sinuous brittle stars were crawling over the coral, crown-of-thorns starfish were eating the coral, and black sea urchins with fearsome, long, sharp spines were occupying crevices in the coral, alongside their cousins with thick, stubby, reddish spines. Delicate feather stars were gliding through the water above the coral.

I was aware of the dangers of such adventures. A swimmer could easily be lacerated on the staghorn coral; that’s why we went early, when the water was calm. We had bare feet, which could never be

allowed to alight on sandy spaces between the corals for fear of a painful death from stone-fish venom. I needed to rest occasionally, and decided that standing on the larger brain corals was my best option. The brain corals evidently objected to such expediency, for they would make my soles slimy if I stayed too long. I saw no coral snakes or cone-shells, which are other extremely venomous reef residents. Once, as I raised my head out of the water, I heard Gabriel call "*Chris – lukim bikpela pis i stap!*" The big fish, manifested in the form of a large black fin, was about a hundred yards further out. Some quick and slightly panicky thinking informed me that I couldn't move fast through the channels in order to escape; nor could the owner of the fin approach me easily. So I just watched. The animal was moving as though propelled by a horizontal tail fin, not a vertical one, and I concluded with some relief that it was a porpoise.

My second swim on the reef, two weeks later, was every bit as wonderful. I focused on fish that time, eventually swimming to the seaward edge of the coral where thousands of them, each a shimmering jewel, swarmed in the water. They paid me little heed as I floated like a whale in the midst of minnows. Gabriel, meanwhile, was trying to spear some fish for breakfast, a tough challenge, given the tiny size of most fish on this scaled-down fringing reef. When we were done with swimming, we lit a small fire at the head of the beach and cooked the few fish he had taken. Their intensely flavored flesh, along with servings of fresh pineapple, made a perfect tropic island breakfast.

Not everything at Loloho was paradise on Earth, though. The Roravana people, whose land abutted the company enclave, had assuredly lost land and quality of life when Bougainville Copper set up an industrial site and a camp full of foreigners on their doorstep. I doubt that they had had much choice over the land transfer. Consequently, they resented the mine and its peripheral facilities deeply. I didn't yet understand that situation fully, the day I decided to explore the beaches just north of Loloho. As I walked behind the rocky headland at the north end of the coral beach, I encountered several Rorovana men working with machetes in the jungle. "*Yu go we?*" yelled one of them, menacingly. Summoning up my best Pidgin, I asked whether I could walk through their land to look for seashells. They let me go through, but said that I wouldn't find many. Soon, I found myself walking along the beach in front of their clean and attractive village of small, wood-framed houses built on poles about five feet high. The houses were thatched with palm fronds, and walled with woven palm matting. It's never cold on the coast of Bougainville, so light construction is sufficient. The houses just need to be high enough to cope with a cyclone surge or a small tsunami.



The villagers took no notice as I proceeded past their village to a quiet place on the shore and stopped to have my lunch. At that moment, two handsome young men appeared on the water in a green and yellow canoe. I wanted to take their photo, and they reacted by spinning the canoe around and beaching it next to me. Sharing my very adequate sandwich lunch seemed to set matters on a pleasant enough footing. I took a very fine photo, and they went on their way to the village.

The villagers had evidently been eating some molluscs, so I returned from my walk with several beautiful shells, notably a trochus, a baby giant clam, and the heavy operculum of what must have been a gigantic edible snail. They sit in our house to this day. In addition to being attractive souvenirs of a tropical island, the shells serve as a reminder of the benefits of treating people with respect -- of asking permission to walk on their land, and of using the local language. I could hardly have blamed them for an uncompromising negative reaction to me as a representative of the exploitative company, or of the colonial power. As my stay on Bougainville continued, I became aware of being observed as an individual on my own merits, not those of the company. As for the Pidgin I had studied, it opened up possibilities I could not have imagined the day I decided to learn the language. And that leads me to several other stories.

AN INDIGENOUS BISHOP, MANETAI VILLAGE, AND CARGO CULTS

Manetai village was on the coast of Bougainville, only 12 miles northwest of Loloho. I had an invitation to go there from another contact I had made after writing to *Wantok Niuspepa*. She was Sister Martine Mangsa, a Catholic nun who ran a medical clinic there. There was no road, and no phone service (although the village did have an infrequently used bush airstrip), so it was something of a challenge to let her know I was coming to visit on a particular weekend, and then to find the means of getting there. I tried the local pidgin radio station, which had a message program every evening, but that didn't work. In the end I resorted to writing a letter, and waiting a week or two for a reply. Sister Martine was to be at the ordination ceremony for the first native-born bishop of Bougainville at Rigu, just south of Kieta, one weekend. I was to locate her there, and travel back to Manetai with her group by motor boat.

The ordination ceremony was a grand *sing-sing* with hundreds present. It was the only time I had a chance to hear Bougainville indigenous instrumental music. Drums keeping a steady rhythm were accompanied by simple flute like instruments that played in unison in a simple up-down-up-down two-note alternation. In keeping with Bougainville custom, the new Bishop performed a ritual usually reserved for a Bougainville tribal chief, whose status is proclaimed symbolically when he stands on top of a pig that has been staked to the ground. In this case, I felt considerable sympathy for the pig, because the new bishop was a portly man. The pig may well have ended up as a celebratory roast later in the day. I wasn't invited to that feast, but I was asked to eat with Sister Martine and her party on the beach later in the afternoon. On the menu was *mumu* -- chicken wrapped in banana leaves and cooked with coconut oil on hot stones in an earth pit, along with the ubiquitous *kaukau* (sweet potato) of Bougainville. After the feast, we all boarded a medium-size motor boat and made the one-hour journey to Manetai, arriving at sunset. I helped pull the boat up the beach into a small lagoon inhabited by some small creatures that bit my feet, eventually causing the only tropical ulcer of my stay in PNG.

A group of young people from Manetai had come down to meet us at the beach with a farm tractor. As we all walked or road up to the village, they must have been commenting on my appearance, because Sister Martine suggested that they be careful of what they were saying, because I might well understand. It was the end of a long and tiring, day, however, and my aural Pidgin wasn't good enough to catch what they were saying. I had been on Bougainville for four very active weeks by this stage, and was absolutely worn out. Sister Martine suggested I sleep as late as I like the next morning, and I finished up spent much of the day relaxing, coming out only in the afternoon for a delicious meal that included a fruit salad made with a huge pumelo. So I had one full day to look around. I accompanied her to her clinic, where she was attending to pregnant women. She told me that they would work in the village gardens right up until their labor began – such was the local expectation. One very striking woman sat down in the waiting area while I was there. She was wearing a fedora hat, smoking, and sitting in a very confident pose that communicated that I should not even think of taking a photo of her.

I remember talking about the airstrip. Sister Martine said that there had been much discussion about the advisability of clearing one. Certain elders, some of whom may well have remembered World War



Farewell party at Manetai

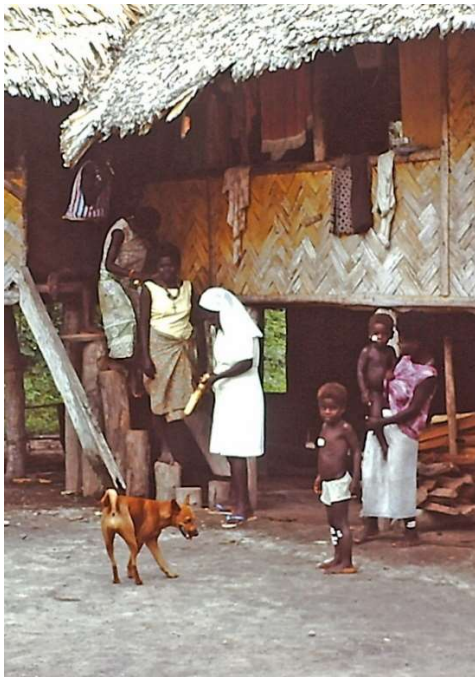


Launching the boat; view towards Loloho

Two, counseled against it, saying *sapos yupela mekim wanpela ples balus, bai birua i kam* – if you build an airstrip, an enemy will come. That must have been exactly what happened during the civil war in the late 1980s. I've recently looked at satellite photos of Manetai on Google Earth. The layout of the village looks much the same as it did in 1974, but the airstrip has vanished. There is now a road a few miles inland, providing ready access for the PNG military all along the east coast of the island. So why did they decide to build the airstrip? It's possible that the villagers were influenced by some latter-day wishful thinking of the cargo cult kind. In the early days of contact with European foreigners, Melanesians would puzzle over how the white man could make ships full of wonderful and almost miraculous objects – the cargo – appear from beyond the horizon. They concluded that magic and ritual must be implicated. The Catholic mass seemed likely to be the relevant ritual, because of its mysterious language, and because of the unwillingness of the priests to allow the Melanesians to perform a mass of

their own. Stolen missals and improvised masses largely failed to produce any cargo. After World War II, possession of an airstrip may well have become the fashion in cargo cult thinking – build it and the cargo will come. That kind of thinking as an attempt to come to grips with an incomprehensible outside world persisted in PNG as late as 1974. It was reported on government radio that one cult leader had instructed his followers to crucify him on a certain day that would fall during my stay, in the expectation that he would rise from the dead three days later as Prime Minister of an independent Papua New Guinea. It was subsequently reported that the man reconsidered his plan as the day approached.

Amusing as such accounts seem to outsiders wise in the ways of a different world, the stories provide a glimpse into the mental struggles of people who fairly recently knew only their home territory, their gardens and their fishing grounds, and were confronted with the marvels and monsters of Western technology. Even in 1974, when they had a tractor and one or two aluminium boats with outboard motors, the Manetai people were aware of the arrival of a very different order of cargo just beyond the borders of their land. For me, being in Manetai for a weekend gave me some feeling for what life had been like before the time of the Panguna mine. But if my hosts stood outside after dark, they could clearly see the headlights of the cars and trucks on the mine access road, small but persistent reminders of an industrial operation of unfathomable scale just 18 km away.



Sister Martine paying a health call in Manetai village; Ordination ceremony at Rigu

CLIMBING MT. BALBI

There was a spectacular viewpoint on the Panguna road where you could look northwest along the mountain spine of Bougainville and see Mount Bagana, a well-proportioned cone, always attended by a long plume of “smoke”, the most active volcano on the island. Beyond it lay Mount Balbi, a higher peak of about 8000 feet, quiet within living memory, but still hot enough to have a bare spot on top with steam issuing. To a young geology student from an island lacking active volcanoes, being so close to them without going to see was just unthinkable. So I made enquiries about light plane access and guides. I soon discovered that nobody on Bougainville was the slightest bit interested in endangering himself for the purpose of peering into the crater of Mount Bagana, but Mount Balbi was a definite possibility. There was an airstrip at a village called Togarau, where guides could be arranged to take visitors up the mountain track, at least as far as the “fires”. Somehow I managed to get an expedition arranged, and found that John (the chief geologist), Ian (another geologist, not my friend Ian from the quarters) and my friend Fred were all interested in coming along. We would be leaving from the Kieta airport, and would need to pack some warm clothes for the overnight stop high on the peak, plus some food. This was early local-initiative eco-tourism, before the term even existed.

Flights in and out of Togarau can't have been too frequent, to judge by the crowd of villagers who assembled to greet us. From the vantage point of the mine, it did indeed seem an isolated place,



View north of the Panguna road. Volcanoes are: Bagana with large plume, Billy Mitchell, Balbi at center of photo.

perched on the lower slopes of a volcano at the north end of Bougainville, far from the coast, and far from any road. In 2014, I was unable to recognize the village or its airstrip on Google Earth; perhaps it

ceased to exist during the civil war. We had a little time left in the afternoon to meet our guides who were two very fit young men, Timothy Taureviri and another whose name I no longer remember. We made arrangements to spend that night in the house of an older man who ran a kind of shop that provided limited outside goods to the village. Commerce into and out of the village was by the light aircraft in which we had travelled, and our host must have had a means of communicating with the pilot to arrange infrequent deliveries and organize guides.



Arrival at Togarau;

Our guides

Next morning we set out, prepared to camp for a night in a shelter at an altitude of about 7000 feet. Timothy and his friend hiked barefoot carrying minimal equipment. They told me later that they had sized us up early in the expedition, and that they expected me and John to make it to the top, but not Fred and Ian. Fred and Ian decided to turn back early in the afternoon, and must already have been too exhausted to retreat too far down slope. As we returned to Togarau the next day, Timothy pointed out the place on the trail where they had spent the night. That they must have been scared I do not doubt, but they didn't ever tell me.

Our climb took us up a long ridge of constant slope, with relatively few views out of the thick jungle. By nightfall, we reached the shelter and had our dinner. John and I found the night-time temperature cool and pleasant, but our guides shivered, and were happy to borrow our jackets. I remember one particular detail of the evening conversation: one of the guides asked us whether there might be any other copper deposits on Bougainville. The geological wisdom of the time was that such deposits form deep beneath large volcanoes just like Mt. Balbi. The guides were incredulous when I said there could well be a deposit "*wanpela mail ananit long hia*" -- a mile beneath us.

Above the altitude of the shelter, the vegetation changed completely. Tall, broad-leaved sedges, like Tasmanian sags but larger, became common. Not too much further along the trail, we walked out into an area with absolutely no vegetation, and saw at the end of a broad curving ridge "*ol paia*", the fires, a set of steaming solfataras issuing from the flanks of a



Night shelter on Mt. Balbi

Oi Paia

gully stained sulphur-yellow. They were to be the end of the trip, because John was having trouble keeping up by this stage. The place was dangerous for at least two reasons: the superheated steam and the sulphur dioxide mixed with it. There was enough breeze to waft the gases away from where I stood, so I was able to venture carefully into the gully of the shadow of death, observe the vents up close, collect some specimens of sulphur, and live to climb back down the mountain.

We reached Togarau by nightfall and spent the night in the same house, having arranged for the light aircraft to pick us up the following morning. A villager wished to take advantage of the opportunity to send a sack of sweet potatoes off to market in Arawa. There were already four heavy men as cargo, however, and a grass airstrip that was only just long enough to get us airborne at the altitude of Togarau. I remember the pilot pulling out his slide rule to calculate whether we could take off with the extra weight of the potatoes. Fortunately he got it right.

SOCIAL OUTINGS TO ARAWA AND KIETA

On three occasions I was able to accept social invitations to go down to the coast. John Baldwin, the Chief Geologist, invited me to dinner with his family one week night. Their house was in Arawa, at sea level. His wife served up a delicious chile. Their air-conditioned house was in Arawa, at sea level, and I remember very clearly stepping out into what felt like a wall of tropical coastal humidity at the end of the evening. I can also remember a discussion of mining-town manners and language, this occasioned by some misbehavior on the part of their four year old son.

A couple of weeks later, I was invited to the house of the brother of one of the Bougainville men I had been talking to at dinner in Panguna. I did this on my way to Rigu for the bishop's ordination. I arrived a bit early, so went walking around the inland edge of Arawa, where I found a beautiful grove of banyan trees with thick clusters of aerial roots. My hosts served me a classic PNG dinner: *kaukau* and bully beef. The *kaukau* is a greyish-white, very starchy sweet potato served steamed or baked, and the bully beef (from the French *boeuf bouilli*) in this case was Spam. After dinner, my friend from the mess

decided we should investigate the Saturday night social scene in Arawa. It turned out that there was a dance, a curious affair that seemed to be Bougainville's adaptation of an Australian teenage dance party. The music was contemporary. When it started, some of the young men, who were standing along one side of the hall, would venture over to the other side, where all the young women were huddled, in search of a dance partner. The women looked their very best in dresses of bright floral fabric. I was the only white person in attendance. I decided to try my luck at finding a dance partner, but the women were far too shy, looking away and giggling to each other. The dance wasn't going to be much fun for me, so we soon went home for the night. I left early in the morning, hitched a ride on a truck to Rigu, and arrived in plenty of time for the ordination.



< Banyan trees in Arawa.

v v The coast at Kieta.



Lastly, there was the outing I made with Titus Keriaha, a relative of Sister Martine at Manetai. Titus was quite the young man about town in Panguna. He seemed to have a reputation among the Bougainville men who worked in the mine geology office, judging by their reaction when it was announced that he had come to the office looking for me. He had bought himself a small Japanese car, and he invited me to accompany him to Kieta for a drink one afternoon after work. The ride down the steep and winding road to the coast was a little scary, because Titus wasn't yet a very good driver. Titus's driving style was to catch up with him fairly soon after our ride to the coast. A week or two later, I received word that he had had a car accident. He may in fact have totaled his car; I did not find out all the details. He was, in

any case, in the Panguna hospital with broken ribs. I went to visit, and felt that I should take a gift. The range of suitable gifts in the Panguna shops was limited, to say the least, but I came up with a couple of paperbacks; Titus was lying in bed keeping still, and the situation rather boring from my point of view because there was no television or radio. Later, it occurred to me that he might not have been in the habit of reading books at all.

Kieta had been the German administrative center for Bougainville prior to World War I, so it was much more established settlement, albeit smaller, than the mine towns. The beach front was beautifully kept, and the foreshore road was lined with an avenue of beautiful tropical trees. The place had the air of a relaxed (or downright lazy) tropical colonial outpost, and for nightlife it boasted the Coco Loco Bar, an establishment that Titus was clearly well acquainted with. While at the Coco Loco Bar, I decided to ask Titus what he knew about an intriguing piece of Pidgin etymology. Sometimes, when the company bus to the coast was overloaded, the New Guinea men would have to crowd uncomfortably close together. Then someone would yell "*biskit!*" -- this term meaning homosexual -- to the great amusement of everyone except the person so accused. Most Pidgin vocabulary has a more or less obvious connection to English or another original language, but not *biskit*. So I decided to ask Titus, thinking that the bar with plenty of other people around would be a non-threatening place to do so. If he knew the answer to my question, it was clearly more than he was about to explain to a relatively new acquaintance. I never did find out what biscuits had to do with being gay.

RABAUL

I had finished my work in Panguna, and was on my way to Frieda, a second copper prospect in the center of New Guinea. At the end of my first day of travel, I finally arrived at Rabaul airport, on the large island of New Britain. Air New Guinea was short one aircraft on that particular day because of maintenance problems, and the airline didn't have enough planes to cover all of the routes. So it was that my plan to get from Bougainville to Lae via Rabaul in one afternoon failed completely. I arrived in Rabaul so late that it was almost nightfall, and I had no plan for finding shelter for the night.

Before I continue with the story, it's worth adding a few observations about Rabaul. I had an excellent view over the airport, the town and the harbor as the plane came in to land. To the eyes of a geologist, the view was striking. The airport was built on a flat piece of land adjacent to one large, forested volcanic cone, and not very far from another that had little vegetation. In a climate that can produce a stand of saplings on a bare-rock road cutting after a year or two, the visible rock on the second cone could only signify continual disturbance as a result of volcanic and associated hot-spring activity. The immediate question in my mind was: How long can all this last? Beyond the airport, I could see Rabaul harbor, a huge, circular body of deep water excavated into the eastern end of New Britain. The harbor occupies a submerged volcanic crater of a larger sort, a caldera produced by a very powerful explosion that had destroyed a former, huge volcanic edifice. I understand that there are parts of the harbor where the seawater still boils. While the volcanoes remain quiescent, the harbor is a fine anchorage,

capable of holding an entire navy. No doubt that is why the Germans chose it as their administrative center in colonial days, and that is certainly why the Japanese military forces occupied it as a base for their planned attack on Australia during World War II. Rabaul was not, in fact, to last many more years beyond my visit. The bare volcano became active again in 1994, covering the town with so much ash that the government abandoned it as an administrative center, moving instead to a smaller town on the far side of the harbor.

Let's return to my immediate predicament. I was on student wages, so hotels, which to me seemed expensive in PNG, were not a real option. I left one bag at the airport, and took my tent and rucksack along the road into town. I reached a place where there was a golf course to the right of the road, and was considering whether I would be noticed camping there. At that point, I realized that it was knock-off time, and that the road was full of New Guinea people walking home from their work in the town. I decided to ask one of them about camping possibilities: *Ating you save we mi inap sanapim tent bilong me long nait?* (Do you know where I could put my tent up for the night?) He thought for a moment, and said *Yu ken kam wantaim mi* -- come with me. He said we should catch a ride in one of the passenger trucks that plied this route. I asked him to wait for a minute while I dashed into a small grocery store on the other side of the road to buy some food. These tiny grocery stores, commonly run by Chinese people, were typical fixtures in coastal New Guinea towns, and they must have provided exactly what the locals needed, but not too many things that a traveler without a cooking pot might find useful or desirable. All I could find that looked vaguely useful were a can of fish and some canned date cake. With these in my bag, we jumped into the back of a truck, and proceeded past the airport, across a bridge and on to an island in the harbor.



My Rabaul friend; View of the harbor and airport from the approaching plane

On our arrival, I was introduced to people who seem to be his family, and was welcomed warmly. Over the next few hours, I learned that I was a guest at a Seventh-Day Adventist mission village, that the island was called Matupit, and that my host was in fact a Southern Highlander, very far from his home in the mountains of Papua. He had gained enough education to move away from his village and obtain a town job. He was lodging with fellow Christians while he worked in Rabaul. During the course of the

evening, we all shared dinner and stories. The can of fish was the perfect thing to bring as it turned out, because their meal was to be rice and greens, to which some fish was a tasty addition. As for the canned cake, well, they helped me to eat it. They seemed particularly interested in my account of the farm where I had grown up. Mixed farms with sheep and cattle in Tasmania were very different from the temporary slash-and burn farms in Papua New Guinea, where the typical livestock would be a few pigs and chickens. Pigs are a measure of wealth for village people almost everywhere in the country, so they thought that my father, who had at one stage kept two thousand wool sheep, must have been a very wealthy man. I really didn't have enough Pidgin English to explain adequately that farm economics in Australia didn't work out so simply.

They offered a place to sleep in their hut, but it looked rather crowded already, so I asked if I can just put my tent up in the small open area in the middle of the village. It seemed a much safer place than the golf course! (I later learned that urban golf courses are regarded by the local people as ideal and comfortable places for nocturnal trysts.) A tent, which I described to them as a little plastic house, *liklik haus gumi*, was such a novelty that the villagers stood three and four deep around me as I pitched it. I had a pleasant and very safe sleep.

At the airport, the staff had told me to come back at 11 a.m. the next day. So next morning, my friend decided to take the morning off work and show me around Rabaul while I waited for my flight to Lae. Later in the day, I found myself strapped into a seat that had been fitted into a cargo plane with few furnishings and little temperature control for an uncomfortable flight along New Britain and on to Lae. This was the best Air New Guinea could manage, and it delivered me to Lae right on nightfall, again, with the same problem as had faced me in Rabaul, but this time in a city that had a reputation for being rough and tough.

While I was on Bougainville, I had come to trust the local people and the New Guineans. This encouraged me to trust several other people on my journey between Bougainville and Madang, as in this case in Rabaul. The people I met were all willing to share what they had, which was not very much by the material standards of Australian life. Nonetheless, each story reflects a true generosity of spirit. The hospitality was always a surprise once I had left Bougainville, because I felt as though I was in a social situation rather different from that on Bougainville where the mining company oversaw most aspects of life. Willing or not, I was also a representative of a colonial power. I had already been in PNG long enough to understand that not every Australian working there was behaving well. Australia must have seemed like a remote and exotic place to most of the New Guinea people. I once heard a radio commentator in Australia remark, only half-jokingly, that the Pidgin term "*heven*" denoted somewhere near Sydney or Melbourne in the minds of many New Guinea people. It was difficult for them to journey to Australia because of the cost, and because the Australian Government wasn't generally encouraging such travel. Even in the cities of PNG, most people were struggling to understand the coming national independence and the outside world -- what it would be like for PNG acting as a single nation state in the broader world. So they were curious about a young Australian who was out travelling on his own, and didn't fit the colonial mold. It helped greatly that I could make an attempt at communicating with them in Pidgin English. I, for my part, was curious about them. Forty years later,

as I write down memories that are so vivid, I'm still of the opinion that I have never since ventured such a large cultural distance from home.

It turned out to be hearing another person's story about Bougainville and Rabaul that prompted me to write about my trip to PNG. I met Harold Elliott in Cascabel, Arizona, when he was about ninety, and was intrigued to discover that he had been to Bougainville during World War II. At writers' night in 2014 at the Cascabel Community Center, a friend of his recounted Harold's story about piloting a bomber from Bougainville to Rabaul, attacking the Japanese military installation there, sustaining a hit from enemy anti-aircraft fire, and then barely making it back to base. His account made me realize that my stories could be written down too – and perhaps shared at the next writers' evening.

FROM LAE TO THE HIGHLANDS

Arriving at Lae airport just before nightfall was a much more serious situation than arriving in Rabaul the night before. The airport and its surrounds were, as far as I could see, completely urban/industrial. I had no idea of where I might go to spend the night in Lae. I really had no desire to spend any time in Lae, which had a reputation for violence even in those days (it's worse now); all I needed to do was find shelter for the night and then work out how to travel up the Highlands Highway to Goroka.

The only choice seemed to be to hop into an airport taxi and ask the driver to take me to an inexpensive hotel. He discussed the possibilities with the gatekeeper for the taxi area, and received a disparaging response in pidgin – if I was a *masta* (a term still in general use for Australian residents of PNG at the time; I hope it has passed out of fashion by now) I should just go to the proper sort of hotel. Once he was well away from the gatekeeper, the driver told me that that he could deposit me at his father's house for dinner, then pick me up once his shift was over, and I would be welcome to share lodgings with him and his house-mate for the night. I accepted his offer, and asked him to take me to a grocery store first. The store afforded me a can of fish and a loaf of white bread, and armed with these I arrived at his father's house. Father and I sat down on our own to dine on my provisions and make polite conversation. The house was occupied by a large extended family, several of whom peered around the door frame at us. It soon became obvious that they were keeping count of the slices of bread and the fish, hoping that there would be enough for the multitude. Fortunately there was still some food left at the time I realized.

My taxi driver friend returned as promised and took me to his dwelling, where I was to experience slum life in Lae. I don't say that with any hint of ingratitude. My new friend was generously sharing what he had, and I was very glad of it, but slum quarters they were. He and his friend shared a room in a wood frame building with at least 5 or 6 similar rooms. The floor was concrete, and the interior walls were unlined. The two men slept on rush mats on the floor. They put me in between, and I rolled out my sleeping bag for cushioning only, because it was to be a hot and humid night. There was a separate bathroom and toilet building. In the bathroom, one could shower under a pipe suspended from the ceiling, being careful not to slip on the slimy green floor. As for the toilet, it was unspeakably dirty, but there was no other choice.

In the morning, my friend asked where I'd like to go next. I said I wanted to go to Goroka, so he took me to the edge of town where the Highlands Highway begins. There were trucks parked beside the road, apparently collecting passengers. One of the drivers agreed to take me to Goroka for a few dollars. A few miles further on, the driver and crew stopped and picked some coconut palm fronds and decorated the sides of the truck with them. The reason for that was a mystery at the time, but once we reached the interior of the island, all became clear. Betel and coconut palms grows only on the coast. The driver and crew were carrying a quantity of betel nuts for sale along the way, and the fronds would alert potential customers to a vehicle from the coast.

The northern side of New Guinea consists of the central range of very high mountains composed of continental shelf limestone (like northern Australia around the Gulf of Carpentaria, but uplifted up to as much as 17000 feet above sea level in West Irian). There's another range on the north coast, which has been accreted on to the island; this contains volcanic rocks as far as I know. A set of present-day active

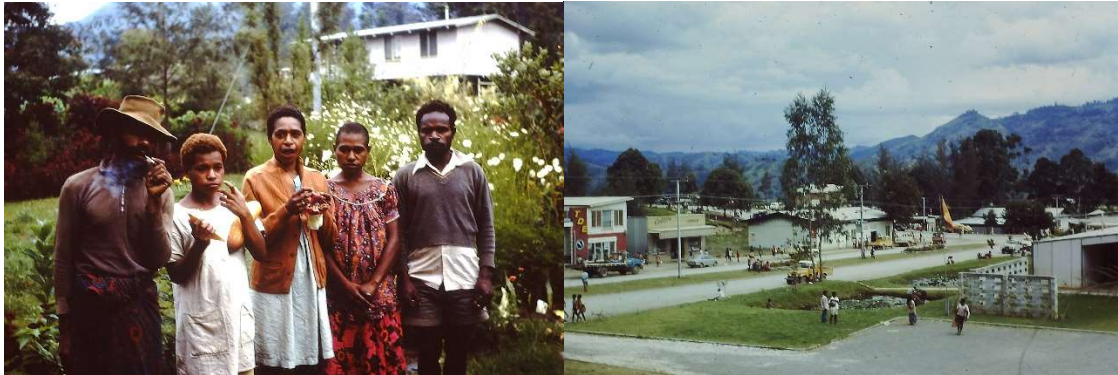


Markham Highway just outside Lae –putting the fronds on the truck; Markham Valley village

volcanoes forms a chain of islands along the north coast. Between the north and central ranges is a broad valley, a suture zone extending right across New Guinea, and drained by several large rivers, including the Sepik further west, and the Markham nearer to Lae. The dry, flat Markham Valley is the easiest place to build a long road in PNG (but not the Sepik valley, which is wetter, and very swampy). The highway extends west along the narrowing valley to a fork. To the right is a road to Madang on the coast, and to the left is the road into the mountains, to Mt. Hagen via Goroka and Kundiawa.

A few miles inland of Lae, the coastal jungle gradually gives way to drier grassland. The few sweltering villages by this section of road consist of clusters of circular houses with thatch roofs supported by poles, and a platform several feet above the ground. Most had no walls. Rather rough, tough and ugly (but no doubt delicious) pigs roamed beneath the houses. There wasn't much sign of villages by the road further inland. New Guinea indigenous agriculture seems better adapted to tropical forest than to grassland, so it's harder to subsist there. We drove through more than one swarm of locusts in that area.

The left fork of the highway eventually leads to the foot of the central range and proceeds to climb the pale green, grassy slopes in at least seven huge hairpin bends. Towards to top, at about 5000 feet altitude, a higher version of tropical forest, including casuarina trees and bamboo, appears. Close to the top, the road crosses a stream with some person-size pools. Several vehicles had stopped at what was clearly a habitual rest-area. The other people in the truck got out and dipped in the water. That would probably have been a good idea for me, too, but I felt uneasy about stripping down to underwear in front of the others, not to mention leaving my valuables on the bank with so many people around.



The people traveling in the truck from Lae

Kundiawa

The people in the truck said they were going to spend the night in Goroka and then continue on to Kundiawa the next day. They asked if I would like to travel further with them, and I agreed to continue. They parked the truck in the driveway of a friend's house, and insisted that I lock myself inside the truck cabin for the night, which made for uncomfortable if safe sleeping. It wasn't so far over the 8000-foot Daulo Pass to Kundiawa, and I would be able to find a ride back the same day with no trouble. So it was that I saw one of the spectacular sights of New Guinea – the Chimbu Valley lying at the foot of the huge limestone scarp of Mt. Elimbari. The valley is densely populated by people living in round



Daulo Pass – Mt. Elimbari

Chimbu Valley sweet potato farms

houses with conical roofs. In contrast to the shifting, slash-and burn tropical agriculture practiced elsewhere in PNG, the Chimbu people have a settled style of agriculture adapted to the eternal temperate spring of these high tropical altitudes. The hill slopes for miles around were cleared of their casuarina and bamboo forest to make the sweet potato fields, many of which at this time of the year were bare, pale-brown soil, having been newly tilled and planted.

The road to the highlands was relatively new in the 1970s; back in the early 1940s no Australian had been there, and nobody in the colonial administration suspected that hundreds of thousands of people lived in the Chimbu Valley. It was only when Australian military aircraft passed over the valley during World War II that the farms and villages came to the notice of the outside world.

GOROKA

Goroka is one of those tropical places, like Guadalajara in Mexico and Ooty in Tamil Nadu, India, that sits at just the right altitude (about 5000 feet above sea level in this case) to enjoy a continuous temperate, spring-like climate. Some of the houses had flower gardens, in which you could find the kinds of flowers that bloom in spring in Tasmania. I particularly remember seeing cosmos. After my nights on the coast, it was a relief to sleep in Goroka.

I must have been tired after arriving in Kundiawa, because I can remember nothing about the ride back to Goroka. I was deposited on one of the main streets with too much luggage to carry around for long, and no idea of where to carry it, so I went into a Chinese shop and asked the owners if they would mind keeping my suitcase for the night. They had no suggestions about camping out, so I shouldered my back-pack and set off along the street to see where it might take me. As I was walking along, a young man came up from behind, and asked "*Masta, yu slip we?* (Where are you going to spend the night?). "*Mi no save gut,*" I responded. His name was Peter Asane Sini, and he invited me to go with him. He led me to the edge of the town, to his family's home – two cabins with woven palm leaf walls and My hosts in Goroka – Peter on the leftthatched roofs – located in a coffee plantation. His extended family lived there – at least three generations as far as I could tell, though the oldest man looked very old indeed, and might even have been my friend's grandfather (which would have made four generations). One of the huts was for the men, and one for the women. They kindly made room for me in the men's hut, which was already rather crowded. I think there were 5 or 6 of us sleeping there that night.

I can't remember how I took care of dinner that time – perhaps we bought something along the way as we went out for the evening. I do remember the purpose of the outing very clearly, however – we went to *ol piksa*, the pictures. The local movie house was a large wooden building, unlined inside, with rows of simple benches. Outside, you could buy drinks, unappetizing coloured sugar-water, and sticky lollies.



My hosts in Goroka – Peter on the left

Goroka market

The house soon filled up for the two movies on offer that evening. One, in color, was about knights and jousting, and the other, black and white, about a group of German women who had political trouble with the Nazis during World War II. Neither story can have meant much to the audience, who were all Goroka people apart from me. So they all just looked at the screen without listening, while the tide of conversation rose steadily until I couldn't follow the movies either.

In the morning, they showed me the washing facilities, a tin can filled with water that looked as though it had been used several times. I decided I could wait till I reached Madang. That journey was my project for the day, so I walked with Peter back to the Chinese shop, retrieved my suitcase, found my way to the airport, bought a ticket, and was on a plane by the middle of the morning. The part of the adventure that involved roughing it, and which had just evolved as it went along, was over, because I had arranged to contact a geologist, Peter Simpson, once I reached Madang.

MADANG AND THE FLIGHT TO FRIEDA

Peter Simpson, the geologist working for Carpentaria Exploration Company on the Frieda prospect, was my contact in Madang. He installed me at the Company guest house where I was able to have my first decent wash in a few days – a great relief in that climate! – then took me to meet his family at the Smuggler's Inn. He said he had an understanding with the hotel, and could use their swimming pool and grounds when he and the family wished. After the rigors of the preceding days, it seemed like the most wonderful luxury to me. I was to be ready to leave in the Company plane for the Frieda airstrip the next day. In the meantime, Peter showed me around town.

Madang is a port town, but was in those days a backwater (and therefore a lot more like a tropical paradise) compared with Port Moresby, Lae and Rabaul. The main thing I remember doing there is going shopping for some wood carvings. A New Guinea man who seemed to be a relative of one of Peter's household helpers had a shed full of the most wonderful pieces. I bought several pieces, and

had a go at bargaining with the proprietor in Pidgin. He seemed somewhat taken aback by my effort! One piece was a poor choice—it was just too big to lug around, and eventually I decided it was rather ugly in any case. I managed to get it back to Hobart (after having to relinquish it to Australian customs in Cairns for inspection to make sure it contained no borers), but once it became clear how much I would need to move around in following years, I discarded it. The other was much more portable – a classic New Guinea spirit face built on to a tortoise shell set in an elliptical piece of wicker-work daubed in colored clay. It had a wonderful curved nose about six inches long. It was one of a pair, the other having a full foot of nose. I preferred the one with the longer nose, but thought its chances of surviving, nose intact, in my luggage were poor. The six-inch nose has survived all of my moves, and still hangs in the bedroom.

Peter also took me to see a small collection of local animals. I remember seeing a crocodile and a cassowary, and I have a picture of a hornbill.



Hornbill at small zoo in Madang

Peter Simpson at the carving shop.

My other memory of Madang concerns the clientele at the guest house. They were all single Australian men, and like the Australians on Bougainville, regarded their posting to Papua New Guinea as a hardship. The atmosphere in the house was bitter and cynical. Worst of the lot were the light aircraft pilots, who behaved like spoiled children. I made them all a meal that night, using supplies they had in the kitchen, plus some highly exotic apples that I managed to find at a nearby shop. I can't remember receiving too many thanks for my efforts, or trying to make another meal for them.

Peter said I was welcome to spend up to a week at the Frieda prospect. We set out the next day. Frieda, named for the Frieda River, is very close to the Indonesian border on the north slope of the central mountain spine of New Guinea. Madang is on the northeast coast of the island, so we had a long flight across the northern part of the island. The pilot landed at Ambunti, on the Sepik River, presumably to make a delivery, and then continued to the Frieda airstrip. The prospect is in rugged, mountainous country, and the closest place for an airstrip was along the banks of the Frieda River, just upstream of where it flowed out into the swampy morass of the Sepik Valley. From there to the Frieda Prospect was a helicopter ride of several miles.



Frieda River Airstrip

It was that flight, coming and going, that gave me the stunning view of the tectonics of northern New Guinea. Everything was visible – the northern accreted island arc, the next generation of volcanic islands off the coast, the suture zone occupied by the Sepik swamps, and the central range of uplifted Australian continental strata. Peter pointed out to me how to recognize areas of obducted ultramafic rock (serpentine-bearing rock, and the mantle rocks it had formed from) along the north flanks of the central range. Those rocks weather to a soil that is favored by araucaria trees, easily recognized by their shape from above.

FRIEDA

The Frieda prospect is on the north slope of the central mountain range of New Guinea, not far from the border between PNG and Indonesia. Even in 2016, the closest road shown on Google Earth terminates at Porgera gold mine, 100 miles to the east along the range. The prospect is one of the wetter places in PNG; geologist Peter Simpson said the annual rainfall was around 400 inches, more than one inch of rain per day on average. It's covered by thick jungle clinging to knife-edge ridges. In December, when I was there, the rain would begin after dark. Once night fell, there wasn't a single artificial light visible beyond the exploration camp, and none in the sky once the clouds gathered. It was the remotest place I had ever visited. Peter left me there on my own for a few days, and asked me to be responsible for turning off the generator at night. That made the utter nighttime darkness of the place all the more impressive.

This part of New Guinea is the territory of the Telefomin people. Living in such a remote part of the island, they had come into contact with Australians only 20 years before my visit. It was said that that first contact had involved a missionary who was killed and eaten by the local residents. Furthermore, at least one of the Telefomin people working at the camp had been involved in that incident. None of them had ventured far beyond their territory. The Telefomins are famous for their traditional male attire, nothing except for a gourd that serves as a penis sheath, kept in place by string around the waist. By 1974, the men had become shy about appearing in camp in such garb, and preferred shorts and a T-shirt. One of them did put on his gourd one evening, so I was told, but vanished into the jungle before I was able to catch a glimpse. So all I have seen is pictures, according to which the most desirable gourds are the ones with shapes that draw most attention, for instance flat spirals, or eye-catching tapering

gourds over a foot long. I imagine that the local horticultural lore includes techniques for training gourds into such shapes. Those must be formal wear for special occasions, because they would get in the way of daily activities.

Pidgin English had already reached the Telefomin people, who spoke it with a thick accent influenced by the consonants in their own language. Many New Guinea languages have a more limited section of consonants relative to English. In the case of Telefomin language, sibilant “s” and “p” must be absent, because they are replaced by “t” and “f” respectively. There is no distinction between “r” and “l”. So when one of the men was speaking to me about writing a letter, which is “pas” in Pidgin, it took me a while to understand his pronunciation, “fat”. The company maps preserved local place-names, which I thought were wonderful. “Ok” means water or creek, and “debom” means mountain or hilltop. I



The exploration camp at Frieda

remember “Ok Nerenam”, “Tomdebom” and “Wisliadebom” (in the latter, the “s” was presumably given a “z” sound). We had a movie one night, and it featured views of the ocean, something none of the Telefomins had seen. Several of them became quite excited, jumping up and down and crying out “Yol ok! Yol ok!” which means salt water.

The camp consisted of a set of wood-frame buildings, many with corrugated iron roofs. There was a movie hut, and a mess hut complete with a New Guinea cook whose repertoire extended to Japanese cuisine. A Japanese company had recently invested in the prospect, and their geologists would visit frequently. It happened that the Japanese manager was to visit during my stay. Peter told me that I would need to appear with appropriate table manners at dinner with the manager. So it was that my first lesson in eating with chopsticks was at the Frieda camp. Dinner with the manager turned out to be a most pleasant evening. He brought some dried seaweed, and appreciated the joke when I compared it

to biotite mica. He also supplied four bottles of sake. There were six of us at dinner, two of whom did not drink alcohol. The rest of us managed to empty the bottles. This led into musical revelry, and I remember the manager singing along as I played Schubert's *Serenade* on my recorder. Peter chipped in with a tune on a bagpipe chanter. The Telefomin workers were quite impressed by the occasion too. I gathered from one of them later that they were hidden in the bushes watching the foreigners getting drunk – "*Ol masta I kamap spak!*"

I went out with Peter to see some geology, but outcrop is rather scarce except for some sulfide skarn right next to the camp. When we went wandering, it was always in the company of one of the Telefomin men, whose main job was to alert us to any swarms of the local wasps. The wasps were said to have very painful stings. I remember the beautiful vegetation, particularly along the creeks, and the first pitcher plants I had ever seen. In the end, most of my sampling took place in the drill core shed, where I needed a helper to lift the trays of core. Peter informed me that my helper happened to be the man involved in eating the missionary. He didn't show any interest in me as food, but he was interested enough in what I was doing to watch and listen as I tried to describe in Pidgin what kinds of things I was looking for in the drill-core. Frieda turned out to provide me with a set of samples I hadn't been able to collect at Panguna: numerous veins of anhydrite plus sulfide. It also boasts the most beautiful porphyries I have ever seen in a porphyry copper deposit – white feldspar phenocrysts sitting in a fine grey groundmass. These porphyries occurred as dikes, and looked like much shallower intrusions than the ones I was familiar with in Panguna.

Frieda was the only place in PNG where I felt any discomfort about the local people. It wasn't conscious misapprehension during daylight hours, but rather emerged in at least one dream. Sleep did seem disturbed in that place, not least because the rain would fall at night, suddenly hitting the metal roof of my hut like bricks after I had dozed off. The dream I remember involved a group of the Telefomin men, who entered my room, picked up the bed with me in it, and carried it around.

Who can tell why my general trust of the New Guinea people would be challenged in that place? I hadn't thought about it for years, until a friend lent me the novel *The Spiral Road* by Dutch author Jan de Hartog. The story includes a description of a contest of wills between a Dutch colonist sent to West Papua and a local witchdoctor who was trying to drive the Dutchman away. How did de Hartog arrive at such an idea?

After about a week, Peter Simpson came back to the camp and announced that it was time to return to Madang. The adventure in PNG ended very rapidly from this point. Christmas was approaching, and I was concerned that seats might be difficult to procure on flights to Australia. Nevertheless, I was almost immediately able to travel back to Port Moresby, and onward the same day to Cairns.



In the field at Frieda – the author is on the left

HAROLD ELLIOTT'S STORIES

The two stories that follow were written down by Harold Elliott as recollections of his service in World War II. . Harold died in 2016, in his nineties. I include the stories here just as Harold typed them up. They represent an earlier generation's experience of Bougainville and New Britain. The story of the bombing raid was read at Harold's direction at a Writers on the River night at the Cascabel Community Center ca. 2012. That story inspired me to write down my own stories, which are equally memoirs of a world that no longer exists. It is my hope that including Harold's stories here will give them a chance of surviving a little longer.



Harold Elliott, about 2010.

AIR STRIKE ON RABAUL

It is Early April 1944 and we take off from the air strip on Green Island in the Solomon Islands. Our flight consists of twelve planes of Marine Torpedo Bombing Squadron 134, and we, along with planes from other squadrons are on our way to attack the large Jap military base at Rabaul on the island of New Britain. Our planes are TBM torpedo bombers each loaded with one 2000 bomb, and our specific assignment is to bomb the runways of the Rapopo air field. As soon as I am airborne and over water I check my guns by firing short bursts and my gunners do likewise. Except for some scattered cumulus cloud buildups the weather is good and we rendezvous in formation and climb to fifteen thousand feet. The long over water flight to Rabaul is a time of apprehension. I have a strong feeling that nothing can possibly happen to me, but I have a mathematical mind and I look at the odds. During the last three months of combat we have lost 5 pilots, all shot down and killed, each one along with their two gunners. Also my best friend, Chuck Dwyer from another squadron was killed over Rabaul. So I know that it could happen to me and there is a tight, tense feeling in my gut.

The scenery is beautiful as we near New Britain Island, and all the colors are very intense—the green forested land, the turquoise green of the shallow water on the reefs, the deep blue of the deeper water, and everywhere the great billowing clouds. As we approach our target we can see that the antiaircraft fire is very heavy today and the sky above Rapopo is dotted with the black puffs of exploding shells. However, we don't see any enemy zero fighters and our protective fighter cover is visible overhead. A flight of SBD dive bombers has preceded us and they are bombing barracks and warehouses near the airstrip. My two wing men and I smile and give each other the thumbs up. The apprehension is gone. We are Marines, veterans of many missions, and we are good at what we do. I turn on the arming switches, open the bomb bay door, and as we peel off to start our dive there is a brief moment of exaltation. We are about to attack the brutal Jap military machine who has slaughtered and raped their way through China and who have beheaded our downed flyers. But this feeling of exaltation is very brief and I must concentrate on the attack. Dive bombing involves just a few seconds of very intense concentration. I have to pay close attention to the airspeed, the altitude, compensate for the changing torque, and above all keep aim on the target. This dive is going well and I feel the bomb will hit right in the middle of the runway. I release the bomb and there is a sudden lift as the plane is now two thousand pounds lighter. But, almost immediately following the release there is a violent jolt. We have been hit! I concentrate on pulling out of the dive but the plane is not responding well and I have trouble keeping the right wing up. The pull out is slow and it is touch and go as to whether I can make it. However, I am able to level off just barely above the jungle tree tops. I check with my gunners in the intercom and they are both ok. I can see that the aluminum covering on the right wing has been ripped off in a couple places. My turret gunner reports damage to the elevator on the tail assembly and the radio gunner can see the fifty caliber machine gun hanging down from the underside of the right wing. Fortunately the engine seems to be running ok. It is about three or four miles to the sea and is a relief to be over water since, if the plane does go down, a water landing is much safer than crashing in the jungle. We are supposed to join up in formation immediately after the strike, but I can see our flight already in formation and several miles off. I know that I won't be able to catch them. My gunners and I look around for any sign of Jap Zero fighters but there are none in sight. The Zeros will go after any stragglers they spot. Now for the long flight back to Green Island. My right arm soon becomes very tired holding the stick to the left in order to keep the right wing up. A corsair fighter passes me also heading home with

smoke pouring from his exhaust. Eventually Green Island is spotted and I attempt to call the tower to let them know I am going to make an emergency landing but discover that the radio is not working, so as I approach the strip I fire a Very pistol red flare to let them know it will be an emergency landing. The landing is bumpy but ok and the plane sort of scrapes to a stop on two blown out tires. My gunners and I examine the extensive damage to the plane and feel fortunate that we made it back to base.

At the briefing tent I am greeted by the other squadron pilots, and after debriefing the skipper invites me to his tent for a shot of brandy. Just two days earlier he had returned from Rabaul with a damaged engine and a bad oil leak, just barely making it back to base and landing dead stick. After chow and a couple hours just shooting the breeze with the other pilots I hit the sack. The guy in the next tent has a wind up record player and he is playing one of his two records, so I go to sleep listening to "Along the Santa Fe Trail". It has been a long day.

Harold Elliott
01/26/04

Bougainville and Some Thoughts About War

Bougainville was quite a place while we were there during the war. A big Jap offensive had pushed the battle too close to the pilot's camp for comfort, so besides all the ordinance blasting away we could hear the Jap chants before they launched an attack. There were frequently stray bullets wizzing by and a couple times a bullet came right through the tent I was sharing with two other guys. We also had other perks in this south sea paradise. There was mud everywhere.

There were frequent earthquakes. The stench of dead bodies permeated everything including our clothes. Shelling injured some of our gunners who lived on the other side of the runway. We frequently had to take off and land our planes while the runway was being shelled.

And, of course, the reason we were on Bougainville in the first place was to fly air strikes against the big Jap base at Rabaul. The missions were dangerous and we lost men and planes. None of this bothered me very much. Everyone copes with the insanity of combat in their own way, some are fatalists and figure that what's going to happen is going to happen and why worry, some are just tough and mean and enjoy fighting, and some just can't seem to cope at all and shouldn't have been in combat in the first place. As for me, I mentally put myself in a suit or armor, only it wasn't steel, it was callousness. This is a good system for coping with combat and bad sights and danger didn't bother me too much. I did get upset when we lost squadron mates but I got over each incident quickly.

My tent mates were Joe Gerard and Bob McGann, and one morning after a major Jap attack, Joe suggested we walk up to the front lines. The Marines had been replaced by the Thirty Seventh Army Division three days before and Joe said he had a friend in it. So, even though it was against orders, we hiked up the very muddy trail passing stretcher bearers coming the other way with some American dead & wounded. The stench got worse & worse as we approached the battle field and when we finally got there it was overwhelming. If we had thought we had been living in some kind of hell at our camp, it was nothing compared to the battlefield hell. The poor soldiers were in trenches in mud above their ankles and they had been fighting almost continuously for three days. They looked very tired. We had to jump into the trenches because of snipers and a Lt. showed us a hole under some logs where we could view the carnage. What we saw was a small cleared area littered with about a hundred bodies and body parts in various stages of decay. Even though I had never seen horrible sights like this, most of it didn't bother me, but something I saw did affect me. There was a blackened corpse of a man leaning against a tree and the skull appeared to be grinning. His empty eye sockets seemed to be looking directly at me and I got this strange feeling that it was trying to tell me something. I am a realist and I knew that an inanimate corpse couldn't send a message, so after thinking about it I realized

that even though I couldn't decipher it, the "message" was created in my own brain. Back in camp there were other things to think about such as fighting the war and this "message" incident got filed away in my memory bank and it was apparently forgotten.

The war finally ended and I found myself on a troop ship full of Marines headed home. As we approached the Golden Gate, I found myself remembering the squadron members who were lost and would never be coming back. It got to me and I was upset. This was the beginning of the melting away of my suit of callous armor but it would take years before it was entirely gone. After college, marriage, kids, etc., I became an aerospace engineer working mainly on

defense related programs. I began to see just how these big defense industries operated and how the armament business had been woven right into the fabric of the American society, and how we had become sort of a war like nation. President Eisenhower had warned about the danger of the military industrial complex but evidently not enough people were listening. So I began to get turned off by the whole thing and also began to become more compassionate when I thought about all the suffering & death brought on by war . My callus suit of armor was melting away fast.

Years later after I had retired Mignon & I attended a squadron reunion in Helena, Montana. It was a pretty big affair and there was a band playing for us. When the band took a break I ended up talking to the band leader. He said that he understood that our squadron was operating out of Bougainville at the same time his outfit in the 37'th Army Division was up on the lines saving our ass from the Japs. So we talked for a few minutes and I told him how I along with two other pilots snuck up to the front line. I mentioned all the carnage we saw and suddenly I thought about the blackened skull. By now my callus suit of armor was completely gone and the skulls message came through loud and clear. It is difficult for me to put it into words, but Ernest Hemingway said it very well "Ask not for whom the bell tolls, it tolls for thee."