# Caution! When in Turbulence do not Pick Nose

Ups and Downs of a Kiwi in Papua New Guinea

Colin Pain

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## Preface

As you read this you may wonder how I remember all this stuff so many years after the events. Well, first I kept all my field notebooks, which contain not only scientific observations but also a kind of narrative of what happened along the way. Second, I kept a lot of correspondence between me and colleagues involved in these adventures. Their letters and my replies make fascinating reading, sometimes 45 years after the events. As one of them said, "Fantastic that you recognised my future greatness (hope that you don't have to wait too much longer)." So when their biographers come calling the letters will all be there. And third, as Mark Twain said, "The further I go back, the better I remember things – whether they happened or not".

There are lots of people I should thank for company and help during my various sojourns in PNG. Many of them are mentioned in the pages that follow, and if I have forgotten some you can blame it on my terrible memory – I remember either faces or names, but often have trouble putting the two together. In particular I want to thank Russell Blong, my kiwi *wantok* (literally "one talk" – someone who speaks the same language and comes from the same place). We spent so much time doing fieldwork and writing together that some of our colleagues referred to us as either Blain or Plong.

A word about the title. I did a lot of flying around PNG – the lack of roads often made it necessary. On one of these flights, in a single-engine Cessna, I saw a notice stuck above the instrument panel: "Caution! When in turbulence do not pick nose". This raised all sorts of images in my mind but when I asked the pilot about it he just smiled. As for the subtitle, I am a New Zealander. Also, the kiwi is a flightless bird that spends a lot of time grubbing around in the forest, something that occupied a lot of my time whilst in PNG.

The book is divided into descriptions and anecdotes of my time in various parts of PNG. The chapters are based on particular parts of

the country. Sections are more-or-less chronological, and explain where I was and what I was doing. In some places I use Melanesian Pidgin, or *Tok Pisin*, words – these are explained as necessary.

Colin Pain
May 2019

# Chapter 1. What was I letting myself in for?

In early 1969, as the Trans Australian Airways Boeing 727 approached Port Moresby International Airport (Jacksons Airport), I caught my first glimpses of the beaches, palm trees and the hills and mountains of Papua New Guinea (PNG). I had recently graduated with a Masters degree in Geography from the University of Auckland, and was on my way to take up a position as Senior Tutor in the Department of Geography at the University of Papua New Guinea (UPNG), then in its third year of teaching. I didn't yet know it, but it was the start of a love affair with PNG, a country that was to play a very important part in my life for more than a decade.

This book ranges around the three main reasons I found PNG so appealing. These can be understood when you learn that I am a geomorphologist – someone who is interested in the origin and evolution of the surface forms of the Earth. First, I was there to see new and wonderful places. When I applied for the position at UPNG all I knew was that New Guinea was a bird-shaped tropical island north of Australia and that PNG formed the eastern half. This lack of knowledge was in itself enough reason to go there. Secondly the country is mountainous – so much so that there are large areas of grassland above the tree line at 3,800 m above sea level. This would certainly offer many interesting walks and climbs. And thirdly, it is full of volcanoes of various shapes, sizes and ages. This appealed to my interest in volcanic ash, or tephra, a product of many volcanoes. I had already found identifying and characterising volcanic ash in New Zealand fascinating, not just because of the story it tells about the history of volcanoes, but also the way it helps piece together the broader story of the evolution of landscapes. So I arrived in PNG ready to see as much as I could, and to walk to or climb up everything in sight. Especially if there was a volcano somewhere nearby.

Before I start the story of my adventures I thought it would be useful to provide a short history, for two reasons. First, at least some readers

will not be at all familiar with PNG – some, like me in 1969, may only be vaguely aware of where it is, let alone its history. Second, some of this will provide a background to my ups and downs, and at least hint at reasons for my travels. First I give a very short description of its geology and other environmental characteristics, and then I talk about people in PNG.

**Geology and Environment**

New Guinea has been described as the bow wave of Australia, bent, pushed and uplifted as the Australian continent moved north at a rate of about 7 cm per year for millions of years. It's still moving – recently Australia's map coordinate system was shifted north by about 1.8 m to catch up with movement between 1984 and 2020. One result of this was the uplifting of the area that is now PNG, but was formerly part of the sea floor. This uplift was accompanied by erosion to form the deep valleys and precipitous mountains that make up the country today. It also led to the great piled and contorted layers of rocks that are found particularly in the southern half of the mainland. There are large areas of sediments, formed on the sea floor but uplifted in the relatively recent geological past. Rivers cutting through these layers of rock form spectacular valleys as they make their way to the sea.

Another consequence was volcanic activity. The oldest volcanoes are in the PNG highlands, and were erupted mainly during the last 2 million years. These highland volcanoes are mostly extinct, although there is a possibility that one or two of them might simply be dormant. Interestingly not even the highest volcano (Mount Giluwe 4,367 m elevation) is on the divide between north and south flowing rivers, suggesting that the deep valleys of highland PNG were formed before the volcanoes started erupting. Much of my research time in the highlands was spent mapping the various layers of volcanic ash that come from these highland volcanoes.

There are many active volcanoes in PNG, most of them on islands along the north coast. There is only one active volcano on the PNG mainland – this is Lamington, which last erupted in 1951. The first volcanic ash deposits I looked at were from Lamington. I also studied volcanic islands along the north coast, and their volcanic ash products in the highlands, as part of my work in PNG.

One consequence of highland volcanism is the layers of volcanic ash that cover much of the highlands. This has led to a distinctive set of soils, formed from this ash, that are highly fertile and able to withstand intensive agriculture without quickly becoming exhausted. Some of my time in the highlands was devoted to mapping and characterising these volcanic ash soils.

Above 3,800 m there is a belt of alpine grassland while below that level there is subalpine forest with some plants that are related to plants in Australia and New Zealand. Then there are the highland valleys, now covered in grassland and cultivation that bear witness to thousands of years of human occupation. Below this there is more rainforest, with a zone between about 200 and 800 m that has relatively few inhabitants. Finally there is a coastal zone with tropical rainforest and some grassland in drier areas. In particular Port Moresby has open Eucalypt savannah vegetation. The boundaries between these zones went up and down during the ice ages as the Earth cooled and warmed and the sea level rose and fell. This vegetation zonation is important for land use assessment, a topic that occupied some of my time in PNG.

PNG is in the tropics so you would expect it to be hot. And indeed it is, with temperatures typically in the 30s during the day at low altitudes. However, there are variations that make for interesting contrasts. For example, Port Moresby has a distinctly seasonable climate – hot and humid during the wet season, which coincides with the southern hemisphere summer, and dry during the southern winter, when winds blow from the south east and being parallel to the coast, don’t cause any rain. There are at least a couple of interesting

consequences. One is that during the dry season people set fire to the grass, so the air is full of smoke and if the fire is close enough, bits of burnt grass. Not good for washing on the clothes line. Another is that sports follow the Australian seasons, so rugby league is played during the dry season when the soil sets like concrete, and cricket is played during the wet season when the soil is soft and sticky. The consequences are easy to imagine.

The climate in the PNG highlands is much cooler than in the lowlands. Temperatures during the day get into the low 30s, but the nights are much cooler and frosts can occur. There is even snow occasionally on the highest mountains of PNG, and further west, in the Indonesian side of the island, there are glaciers.

**People**

When I arrived in 1969 PNG was administered by Australia, and was known as the Territory of Papua and New Guinea (TPNG), or simply the Territory. This came about partly as a consequence of British and German colonisation in the area, and two World Wars. In 1884 Britain declared the southern part (Papua) to be a protectorate, and Germany annexed the northern part (New Guinea). Australia became responsible for the Territory of Papua in 1906. After the First World War, during which Germany lost control of New Guinea, the League of Nations gave Australia a mandate to administer New Guinea. Following the Second World War the two areas were declared to be one administrative unit, the Territory of Papua and New Guinea, administered by Australia under the United Nations Trusteeship Council. Papua New Guinea became self-governing on 1 December 1973 and achieved independence on 16 September 1975. I was present for the latter event.

The preceding is of course a very Eurocentric view. People have been living in the island of New Guinea for perhaps as long as 50,000 thousand years – there is evidence for settlements as old as 40,000 years along the north coast. The first people to arrive in the

PNG highlands were hunters and gatherers who probably made their way along the upper boundary of the forest before 30,000 years ago. At this time the montane grassland was much more extensive because of the ice-age (Quaternary) lowering of vegetation belts on the New Guinea island. The tree line stood at about 2100-2400 m above present sea level. These early arrivals would have established themselves more easily along the tree line – grassland boundary than in the lower forests. They would also have found these areas more convenient for travel. They used the high altitude grasslands as a travel route, and were looking for the basic resources of food and shelter, both easily obtained from the forest-grassland boundary. The area above the tree line contains many trade routes that were still in use until recently, illustrating the ease of movement in these areas compared with the montane forests. Trade routes passed over Mount Giluwe, and the Kubor Range, as well as the Bismarck Range. Salt, pigments and stone among other things were extensively traded throughout the highlands. These days a road network has replaced the traditional routes, but often the transport is still by walking.

Beginning perhaps as early as 10,000 years ago, people began practicing agriculture in the PNG highlands, at a time when northern Europeans were too busy running away from sabre-toothed tigers to settle anywhere for very long. The evidence for this comes from Kuk, in the upper Wahgi Valley, where layers of peat and sediments in the Kuk swamp demonstrate a number of stages of agricultural use of the swamp accompanied by elaborate water control systems. I will talk about this later, because I was involved in the research at Kuk in a peripheral way.

There is thus a long history of agriculture in PNG, with subsistence shifting cultivation and sedentary tillage being practised right to the present day. Because of environmental differences, sedentary agriculture tends to be confined to the highland valleys, while shifting cultivation occurs in the hill country at lower altitudes. Again, I will talk about this later because some of my work revolved around soil surveys and land assessment.

In prehistoric times the resources of the highlands were seen in terms of their usefulness to a Stone Age society. The arrival of Europeans in significant numbers brought a change in the view of resources in PNG. The European view can be largely summarised by four words, gold, government, missionaries and plantations.

There were a number of contacts with outsiders from Europe as early as the 17th century, but the first influx of Europeans in any numbers along the southern coast came with the arrival of prospectors in Port Moresby in the 1870s, followed by missionaries and the government (at that time British) in the 1880s and 1890s. When the Australian Government assumed control in the 1900s, the Papuan area was seen as a potentially rich and profitable possession whose resources were available, and should be used. To this end land was made readily available on a leasehold basis and plantations became established. One was managed for a time by an early Australian export to Hollywood – Errol Flynn. The Papuan Hotel had one of his bounced cheques framed behind the bar when I was there. Government and missionary influence also spread along the coast by the mid-1920s. Similar expansion occurred in the northern area of the then Mandated Territory of New Guinea.

It was not until the 1930s that the highland valleys were opened up. The Wahgi Valley was first visited by Europeans in 1933, with the patrols by Taylor and the Leahy brothers, the former representing the government, and the latter prospecting for gold. Earlier, in 1930, Leahy and Dwyer had travelled down the Asaro, Tua and Purari Rivers in the first patrol by Europeans to cross the area from north to south. Further west and also in the 1930s, Jack Hides and Ivan Champion led expeditions into the PNG highlands. During my time in the highlands I met people who remembered Jack Hides' patrol. I was also lucky enough to meet Dan Leahy who in later days ran a coffee plantation near Mount Hagen. Both these encounters are a measure of how recently the rest of the world became aware of the PNG highlands.

The expectation of mineral wealth brought Europeans into the area, but this was not really fulfilled. Instead, the people of the area became a major resource, for both missionaries, plantation owners, and the government. These three groups had rather different intentions, but they were basically after the same thing, people either to swell their congregations or to work as labourers. The government had the additional responsibility of introducing European-style law and order, and developing the communications network. Initially the latter consisted largely of airstrips, with later development of roads. This had the interesting consequence that often the first wheel the highlanders saw was on an aeroplane. Some effort was also put into development of the agricultural capacity of the local people, which helped satisfy their needs for a way into a cash economy. Papua New Guineans began producing significant quantities of coffee, and smaller amounts of tea and pyrethrum, in the highlands.

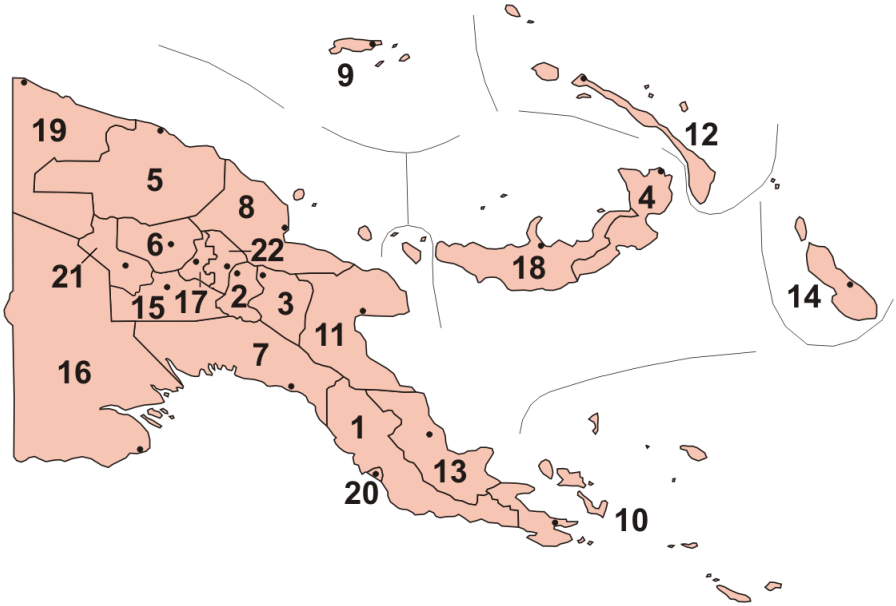
There is a distinct separation between the highlands and the coastal lowland areas of PNG, with a zone between about 200 and 800 metres above sea level where there are very few people. The central highland areas have dense populations and intensive agricultural systems. Outside these areas shifting agricultural systems operate under conditions that do not allow periods of cultivation of more than a few years at most. The 200 - 800 m zone is in a sense a barrier between the two parts of the country. This barrier is exemplified by the road network. There is no road link between the highlands and the lowland areas of the southern coast, although it is possible to travel by road (the Highlands Highway) into the highlands from Lae and Madang.

There has been considerable effort devoted to a systematic reappraisal of the resource base of the highlands. Highland provinces are now in the implementation phase of integrated rural development projects, the basic aims of which are to assess the subsistence base of the rural economy, and to find ways of improving the way of life of the people. I was involved in some of these projects with work on the assessment of soil resources. There has also been renewed activity in

the area of mineral and oil exploration with some success, and the major rivers have been considered for hydroelectric power schemes.

The following map gives the location of PNGs provinces, and the province names and capitals are in the table.

| | Province | Capital | | Province | Capital |
|---|---|---|---|---|---|
| 1 | Central | Port Moresby | 12 | New Ireland | Kavieng |
| 2 | Simbu | Kundiawa | 13 | Oro (Northern) | Popondetta |
| 3 | Eastern Highlands | Goroka | 14 | Bougainville | Buka |
| 4 | East New Britain | Kokopo | 15 | Southern Highlands | Mendi |
| 5 | East Sepik | Wewak | 16 | Western (Fly) | Daru |
| 6 | Enga | Wabag | 17 | Western Highlands | Mount Hagen |
| 7 | Gulf | Kerema | 18 | West New Britain | Kimbe |
| 8 | Madang | Madang | 19 | Sandaun (West Sepik) | Vanimo |
| 9 | Manus | Lorengau | 20 | National Capital District | Port Moresby |
| 10 | Milne Bay | Alotau | 21 | Hela | Tari |
| 11 | Morobe | Lae | 22 | Jiwaka | Banz |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# Chapter 2. Port Moresby and Central Province

## Port Moresby 1969 – Thrown in at the Deep End

Late in 1968 as I was completing my Masters degree in Geography at the University of Auckland, I saw an ad for a position at the University of Papua New Guinea, in Port Moresby. All I knew about the place was that it was the eastern side of a bird-shaped island north of Australia. But, nothing ventured nothing gained, so I applied for and was successful in getting an appointment as a Senior Tutor in the Department of Geography. Among other things I had to undergo a medical examination. The doctor listened to my lungs, tested my reflexes and thumped my back and chest. He snapped on a rubber glove and subjected me to that most undignified of procedures, a rectal examination. Then he took my blood pressure. He looked a bit puzzled, then grinned and said "I think we did that in the wrong order". So, with a clean bill of health, I was off to PNG.

My first impression of Port Moresby as I descended the stairs from the Boeing 727 in 1969 was the heat and humidity of the wet season. I was met by Professor Gerry Ward, David Lea and Mike Brown, all from the Department of Geography at UPNG. The first port of call was the veranda bar of the Gateway Hotel, which overlooked Jacksons Airport. The heat was partly assuaged by my first taste of South Pacific Lager (SP), the local beer that came in green and brown stubbies (330 ml bottles). I was to discover that people tended to drink either green or brown SP, swearing that there was a big difference. Perhaps there was – I preferred SP green. There was a sign at the entrance to the hotel noting that patrons had to wear either tidy clothes and shoes (no thongs/flip flops) or traditional dress. For the most part this was fine, although I still wonder what would have happened if someone from Telefomin had turned up wearing his "Telefomin trousers".


*Telefomin trousers. Photo: Papua New Guinea Business and Tourism*
*http://www.pngbd.com/photos/cultural-events/p16070-telefomin-men.html*

In 1969 the population of Port Moresby was about 50,000 of whom about 20% were expatriates. Now, 50 years later, it has about 400,000 people. Thus in 1969 the University was on the outskirts of the city, and close to suitable field areas. The Department of Geography was in a house across the road from the main university campus, which was still being built. Later in the year we moved to the upper floor of a two-story building designed for student accommodation but empty because of low student numbers, the university being only three years old. During 1969 the main lecture theatre was completed in time for film of the first Moon landing to be shown there a couple of days after it happened. We had listened to

the landing live on local radio because PNG had no television in those days.

There were some quirky little features. One was that playing cards were illegal – they were listed on the arrival form among other such lethal items as guns and knuckle dusters. Apparently the first Papua New Guinean members of the legislative assembly, products of mission school education, had proposed a ban on playing cards as one of the first pieces of legislation to be tabled by indigenous Papua New Guineans. Expatriates were allowed to play in the privacy of their own homes, but only after obtaining a licence. There was a flourishing black market in 5x3 cardboard system cards, which were ideal for homemade, but still illegal, playing cards.

Another interesting feature was the punkah in Burns Philp, the main department store in Moresby. A punkah is a canvas-covered frame that hangs from the ceiling and sets up a breeze by swinging back and forth. In Burns Philp there were several of them all connected to an electric motor that swung them to and fro. A century earlier in India and other parts of the British Empire they would have been operated manually by a punkah wallah, so Burns Philp was, to an extent, modernised.

There was a saying that the Territory was built on Marsden matting. Marsden matting is standardized, perforated steel matting material originally developed by the United States for the rapid construction of temporary runways and landing strips. Great amounts of Marsden matting were brought to PNG during the Second World War and it was all over the place in 1969, including a second and rarely used runway at Jacksons Airfield. Individual pieces made fine gates and fences, and a few laid end-to-end were good for strengthening wooden bridge decking. On one occasion I was in a DC3 landing at Jacksons – at the last minute the pilot swerved the plane to the left, and landed on the Marsden matting strip. The racket the wheels made running over the holes in the matting had to be heard to be believed. It turned out the pilot had spotted another plane on the main concrete

runway, and fortunately had time to make the adjustment needed to avoid running into it.

*Top – Marsden matting runway (http://www.usmilitariaforum.com/). Bottom – Marsden matting fence (https://riskyplaces.files.wordpress.com/2013/04/img_6823.jpg).*

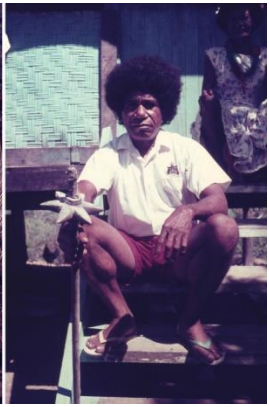
Jacksons airport, also known as 7-mile during the Second World War, was surrounded by U-shaped aircraft dispersal bays that were used to park aircraft during the war. This made it more difficult for Japanese bombers to destroy aircraft during bombing raids. Leftovers from WW2 were all over the place. There were the remains of crashed aircraft on hillsides, and ordinance, some unexploded, to be found in odd corners. One university staff member was alarmed to find that his son had been making a collection of shells and other stuff in their backyard.

Most shopping was done in supermarkets, of which there were a few, Chinese trade stores of which there were dozens, and Koki Market, where the vegetables, fruit and fish were in various stages from fresh to decayed. The trade stores supplied everything from clothes to electrical fittings. They also had great stocks of rice and tinned mackerel pike, fish that were plucked out of PNG waters, taken to Japan, put in tins and then shipped back to PNG. As I was to discover, this was standard fare for many Papua New Guineans, especially in the highlands where it went by the *Tok Pisin* name of *tin pis*.

A short few weeks after my arrival, with accommodation arranged and a car bought, it was time to sort out classes, and find field areas for student fieldtrips. My first foray into the field was to a patch of rainforest opposite the university. This was one of only a few patches in the area, because most of the Port Moresby landscape consists of an open Eucalypt savannah. So there we were walking through the understory when I felt something grab the back of my leg. In the New Zealand bush this would almost certainly be bush lawyer, a vine with hooks that grab any clothes and skin that goes by, so I wasn't worried. I looked down to see how best to get the bush lawyer off, and was confronted by a spider that seemed to be the size of my hand holding on very tightly to my calf muscle. I calmly leapt into the air and frantically batted it off. Not that I mind spiders you understand . . . . That was my first brush with wild life that was rather different from what I was used to in New Zealand.

This was followed by other expeditions. Idlers Bay, on the other side of the harbour from Moresby, was a favourite place for picnics. The road was a bit challenging, but the destination was a wonderful place for swimming and generally lazing about. Snorkelling off the beach to the edge of the fringing reef was fun, and I will always remember the sudden drop at the reef edge where the water plunged to a great depth.

Suvitatana, south of Moresby, was also worth a visit. The guest house cost $2 per night including meals (as long as you liked yams). One of the village councillors showed us a lethal looking club that must have given the opposition pause for thought.



The hills around Moresby provided opportunities for walking. The highest peak in the area, Tovabada at 300 m, gave great views of the surrounding landscape and also the Owen Stanley Range, with Mount Victoria, at 4,038 m the sixth highest mountain in PNG, in the distance. The local hills and beaches also provided good places for student fieldtrips and, of course, needed checking out before taking the students. On one of these trips we noticed a flock of small birds that were red on the front and white at the back, so the flock changed colour from red to white depending on whether they were coming or going. A local man with us picked up a stick and threw it into the

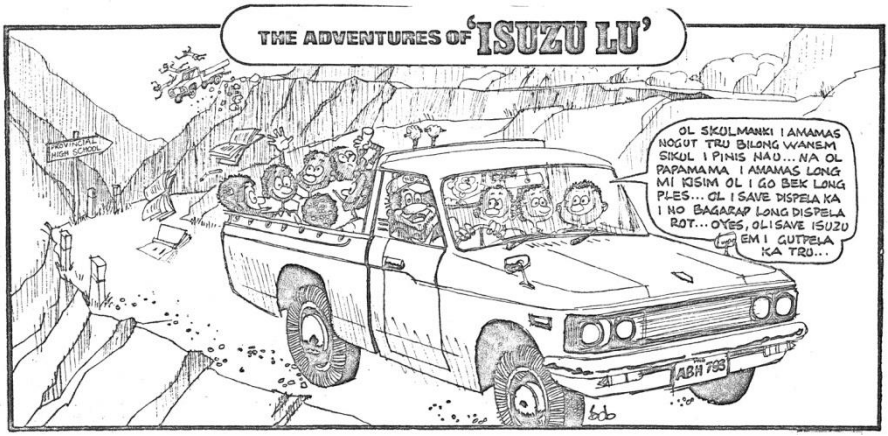
flock. He pounced on the ones that fell to the ground and ate them feathers and all.

The Sogeri Plateau was a favourite place for picnics. The plateau is made of agglomerates – volcanic rocks composed of stones and rocks in a fine matrix usually considered to originate as very hot flows. It also has rubber plantations. There are lots of picnic places, including Warriarata National Park, on the edge of the plateau facing Port Moresby. The road to the plateau passes the Laloki Falls, where the Laloki River exits the plateau. Nearby the Sogeri Hotel was a good place for lunch, which included crocodile steaks if you were so inclined. There were also people selling magic mushrooms on the side of the road.

On the eastern edge of the plateau the agglomerates give way to metamorphic rocks of the Owen Stanley Ranges. The Goldie River runs near the contact and at one point exposes limestone, where there is a small but interesting cave. Further north Owers Corner sits on the edge of the plateau – this is the start (or finish) of the famous Kokoda Trail, or Kokoda Track.

In Moresby it wasn't necessary to learn *Tok Pisin* because the lingua franca on the southern side of PNG was *Hiri Motu*. However, once on the other side, and in the highlands, it was necessary to know at least some *Tok Pisin*. Each morning at 6:30 there was a 5 minute *Tok Pisin* lesson on the local radio. "Learning Pidgin" was presented by Sargent Mike Thomas of the Papua New Guinea Constabulary and helped a bit, although his attempt to describe nuclear fission in *Tok Pisin* was a complete failure. Each session was introduced by some bright music, the source of which was revealed at a screening of Barbarella. As we waited through the preliminary credits for Jane Fonda to make her appearance, the theme from "Learning Pidgin" came blasting out of the speakers to be greeted by roars of laughter from the mainly expatriate audience.

Another way of picking up some *Tok Pisin* was from the PNG Post Courier, which each day printed an ad for Isuzu vehicles in the form of a cartoon. One of Isuzu Lu's offsiders was Mista Kuka (for ghost who cooks), an expert at the art of the BBQ.




*Loose translation – "All the school kids are very happy because school has finished . . . and all their parents are happy that I am taking them back to their village . . . they all know this car will not break down on this road . . . oh yes, everyone knows Isuzu is a very good car."*
*(https://faroutliers.files.wordpress.com/2009/09/isuzulu-skulmanki.jpg)*

Even with all the traveling around the Moresby area and beyond I still had time to teach. Classes started at 7:30 am and the working day finished at 4:06 pm. Why such odd hours? Well, it turned out that originally government hours were 8:00 am to 4:00 pm on Monday to Friday, and 8:00 am to 12:00 noon on Saturdays. At some point Saturday became a holiday and the three hours were added to Monday-Friday. Makes sense I suppose.

I was concerned mainly with first year students, who were similar to students I had taught at the University of Auckland. The main difference was their command of written English, not surprising

because it was very much a second language. Most Papua New Guinean students spoke several local languages – there are more than 850 languages spoken in Papua New Guinea making it the most linguistically diverse place on Earth. However, at school they were frequently taught by teachers for whom English was also a second language. In order to partly resolve this problem all Papua New Guinean students undertook a Preliminary Year course before starting first year. However, university courses taught in English were still a challenge. Add to this the vast difference in culture and life experiences between the teachers and the taught and you begin to see the problems faced by UPNG in its early years. I'll have a bit more to say about this a few sections down.

One incident I remember was arriving in the Geography Department one morning to hear staff member Bill Jonas on the phone saying "That's right – I stopped when I hit the kitchen table". It turned out he had come home the previous night and turned into his car port at which point his brakes failed. He went straight through the wall next to his front door and ended up in the kitchen.

**The Kokoda Trail and Environs**

I had been in PNG for only a few weeks when people started asking "Are you going to walk the Kokoda Trail". My response was along the lines of "Yes, but what is it?" It turned out that the Kokoda Trail was an important part of the Australian war effort in the Pacific during WWII, when the Japanese landed on the north coast and proceeded to fight their way through the jungle and over the Owen Stanley Range towards Port Moresby. They were eventually stopped at Ioribaiwa, a village about 2 or 3 days walk from Moresby. Details of the Kokoda campaign can be found in many books and now on many web sites. If you are interested in walking it I particularly recommend Bill James "Field Guide to the Kokoda Track" (see Further Reading).

So, yes I was interested, but how to go about it? This was partly solved when several of us from the Department of Geography took a trip to Popondetta and Kokoda, in the Northern Province, in June 1969. While in Kokoda (near the northern end of the trail) we met Chris Day, the District Officer in Charge, with whom I arranged to keep in touch. He undertook to provide a ride from the Kokoda airstrip to the beginning of the trail. And in August I walked the first few kilometres from Owers Corner to Imita Ridge and back with colleagues from UPNG.

The next step was to find some companions for the walk. The UPNG Accountant and the Personnel Officer were willing, so in September 1969 we found ourselves at Kovelo, the beginning of the Trail. I described the walk in the first edition of "Bushwalking in Papua New Guinea", published by Lonely Planet in 1983, so I won't go into the gruesome details here, but rather just give an outline. Incidentally, this was the first time I came across the *Tok Pisin* phrase "*longwe liklik*" – long way little. It is the usual answer you get from local villagers when you ask how far it is to somewhere. In my experience it could mean anything from 10 minutes to 10 hours walking.

The first day saw us climbing out of the Kokoda Valley and then on to Isurava, a walk of 7¼ hours with stops. That night we stayed in the village guest house – we were entertained by mice during the night, and woken by roosters before daybreak. In a place where very few people had watches, at least in those days, roosters played an important role in time keeping. There are three times in the rooster clock, *numba 1 kakaruk* 1 hour before dawn, *numba 2 kakaruk* at dawn, and *numba 3 kakaruk* 1 hour after dawn (*kakaruk* is rooster in *Tok Pisin*). So, having awoken at *numba 1 kakaruk*, we were ready for the second day, leaving Isurava at 6:45 am. 10 hours later, after crossing and recrossing the Iora River, at about 4:40 pm we found a bush hut at Templeton's crossing suitable for the night.

*Our accommodation at Templeton's Crossing.*

On the third day we spent another 10 hours walking, through the Gap (the highest point on the trail), and then on to Kagi and Efogi. We knew there was a Summer Institute of Linguistics (SIL) American couple in Efogi. (SIL is an organisation that sends people off into the wilds of the world to translate the Bible into the local language.) That's where we spent the night after meeting and eating with the Americans. This was also where my companions decided they had had enough. They declared that they were going to wait for the weekly flight from Moresby that was to arrive in three days' time, and fly back home. I wasn't too surprised at this, because their training had consisted mainly of walking from the car to the bar and then back again after a few beers. I, on the other hand, had to continue because I had arranged transport from Owers Corner back to Moresby in two days' time, and was unable to cancel the arrangement, this being long before mobile phones and the internet.

The following day I set off alone at 6:45 am. The first village I came to was Menari, where the locals gave me as many mandarins as I could carry. Then on to Nauro, where there was a resident Dutchman running an agricultural station. At one point I got lost, and blundered

into the middle of a church service – it must have been Saturday because the people along the Kokoda Trail are Seventh-Day Adventists. After apologising I sat quietly until they had finished, then they all took me to Nauro so I wouldn't get lost again. Crossing the Nauro River on a log raft was a bit of a trick, but I managed to avoid falling in the water.

*Crossing the Nauro River was a bit of a trick.*

The Dutchman turned out to be a cheerful fellow who plied me with tea in his front room, which was full of left-over bits from the war – shells, grenades, pistols etc. He said he kept on digging them up in his garden, and told me how his rotary hoe stopped suddenly one day because an unexploded grenade was stuck in the blades. At about 1:00 pm I set off again up the Nauro hill, which a photocopied guide I had found somewhere told me had countless false crests. I counted them and found there were eleven. I then followed a more-or-less level path along the ridge above Nauro until it started raining, at which point I found a lean-to in which to spend the night. During the

night I was rained on and serenaded by tree frogs. A couple of trees crashed to the ground, fortunately some distance from my lean-to.

*The lean-to near Nauro.*

The final day involved walking to Imita Ridge, which I had already visited in August, and then on to Owers Corner, a total of about 9 hours. I reached Imita Ridge just after midday and was planning to have a lunch break, but hordes of sweat flies drove me nuts so I kept on going.

I see from my notes that the grand total walking time was 39 hours and 5 minutes. I must also note that I was so busy walking that I didn't have time to look at the details of the landforms and geology, most of which was covered by tall rainforest in any case. The Kokoda Trail had, and still has, a reputation for being a very difficult and unrelenting walk. However, it's all relative. I was used to long up and down walks in New Zealand and found the Kokoda Trail no great challenge. I suspect its fearsome reputation comes from the fact

that many who take it on have never done any similar walks and are therefore quite unprepared.

*The view northeast from Imita Ridge – the landscape is typical of the walk.*

Later in November 1969 I returned to the Myola Lakes area with UPNG staff members Mike Brown, a geomorphologist, and Ross Robbins, a botanist, to remedy, at least in part, the lack of observations from the full Kokoda Trail walk. The Myola Lakes name refers to two areas of grassland near the top of the Owen Stanley Range. They are east of the main track, but easily accessible from Kagi, which was our starting point. We left Moresby airport at 7:30 am and arrived at Kagi at 8:00am. After arranging guides and carriers we set off, and 4 hours later we arrived at Myola No. 1 with enough time to get settled in a bush hut before the rain started.

Our first inspection of the swamp was memorable because one of my companions dipped his bare foot into the water and out again to find a very large leech attached to his toe. After some flailing about we

got it off. I can't remember what we used, but salt, or a lit cigarette, are effective. After a few run-ins with leeches I found the best remedy was to paint a stripe down their backs with an alcohol-based permanent marker pen, of which I always had a supply for marking plastic sample bags.

Our three carriers were knowledgeable about the area and were able to show us where we could get water. They were accompanied by 8 young boys who were learning about the area, and who were a bit like dogs in that they spent the walk running to the front of the party and then back again – they must have covered at least twice as much ground as the adults. The rain was a bit of an issue because the roof of the hut leaked, but we fixed that with strategically placed Pandanus palm leaves as natural gutters to lead the water outside. The temperatures were comfortable, $12^{o}$ C minimum to $29^{o}$ C maximum in the grasslands and a bit lower in the forest.

There was a WWII mortar bomb in the corner of the hut, and I found another one 5 days later when I kicked out the fire we had been using for cooking. Myola Lakes both 1 and 2 are full of WWII left-overs because the area, being free of forest, was used as a staging ground during the Kokoda campaign. There were foxholes on the slopes, many of them all but invisible in the long grass. One of our carriers disappeared into one with a yell, and we found him by homing in on his shouts. The remains of a Ford Trimotor, the same type of aircraft flown by Charles Kingsford Smith in the 1930s, sat at the end of a disused airstrip in Myola No. 2. In 1942 Tommy O'Dea flew the aircraft into Myola as an experiment to see if it could be used to evacuate wounded soldiers from the Kokoda Trail to base hospitals in Port Moresby. It flipped over on landing when the wheels got stuck in the muddy ground. All thoughts of evacuating patients by air from Myola were then abandoned, and O'Dea, injured in the crash, had to be evacuated by the tried and true method – carried by "fuzzy wuzzy angels".

*The remains of Tommy O'Dea's Ford Trimotor.*

There were lots of birds around, including some birds of paradise. We didn't see any but we could hear them. One sounded like a machine gun – its forbears must have scared the daylights out of soldiers during the war. Singing frogs kept us company at night, and there were wild pigs around – we could see the results of them looking for food in many parts of the grasslands. One of the carriers shot a pig, but only one of them could eat it, the other two being Seventh-Day Adventists and therefore unable to eat pork. These two could not work on the Saturday either. We were offered some of the pig after it was cooked but after due consideration we declined.

We stayed a night at Kagi on our return, and were picked up at 7:30 am for the return flight. Kagi was a typical mountain airstrip, sloping, and with several bumps to aid the aircraft to get airborne. After we boarded, the pilot radioed Moresby "Taxiing at Kagi", then waved to the assembled mob, some of whom picked up the tail and swung us around until we were pointed downhill. Then off we went, lurching into the air and back onto the strip at the early bumps before finally staying up after another bump about two thirds of the way

down. When watching a take-off from the top of the airstrip the plane charges off down the strip and then disappears into the valley below the strip before returning into view as it climbs out of the valley. All good fun.

*Cessna 180 on Kagi airstrip.*

I visited Myola Lakes again in 1971, on my return to Canberra from my PhD fieldwork in the highlands. I was accompanied by Russell Blong, my Kiwi *wantok*, and constant companion on many PNG escapades. We flew into Kagi with the stall warning going off interminably and then were caught unawares by the sudden gunning of the engine to get up to the top of the strip. We walked to Myola No. 2, where we spent the night in a chalet made from the wings from the Ford Trimotor. We then walked back to Owers Corner over about 3 days, stopping at Efogi and staying with the SIL couple. I forget the exact details – for some reason I don't have any notes. But I remember the trip for several reasons. One was that Russell had fallen in lust (unrequited) with an Ansett hostie (Canadian and petite he tells me), and every time a plane flew over he would sigh and wave. Another was abandoning shirts and socks along the trail as they became too gamey to wear, and throwing our boots into the bush at the end. When I asked him recently, Russell also reminded me that we found a dead snake stuck half out of its hole in the middle

of the track - probably having eaten too much, and that there were masses of the debris of war (bullet casings and bits of rusted steel) that really bought home the fact that there had been some serious fighting during WWII. Russell also muttered something about me carrying notes from my earlier trips and noting with glee how many false summits there were on every uphill slog.

When we reached Goldie River, at the bottom of the path down from Owers Corner, we plopped ourselves in the water to wash off the accumulated sweat and grime. The resulting sediment plume, having travelled down Goldie River, is probably still making its way across the Papuan Gulf. We had arranged a pickup at Owers Corner, and when we arrived our "chauffeur", having waited all of 10 minutes, was about to leave. On our way back to Canberra, we visited a doctor in Cairns with leech bites turning nasty, to learn that they were in fact scrub mite bites and we were lucky not to have caught scrub typhus.

*Wings from the Ford Trimotor made into chalet-style accommodation. The whole plane was airlifted out in 1979 and is now in the museum in Port Moresby.*

## Northern Province

Northern Province (now called Oro Province) is over the Owen Stanley Ranges from Port Moresby. I first visited the Northern Province in June 1969 on a trip already briefly mentioned above. We flew over the Owen Stanley Range pretty much following the path of the Kokoda Trail. After landing at Popondetta we drove to Gona, on the coast. This is where the Japanese army in New Guinea was defeated in WWII. The Northern Province had coffee and rubber plantations. We also visited Kokoda, which consisted of the government station with a District Officer in Charge (DOIC), a school, and a Chinese trade store about 2 m square that went by the grand name of Ping's Emporium. The surrounding area had lots of terraces and volcanic ash soils, and seemed like a good place to carry out some research on the landforms and soils of the area. I have already mentioned the DOIC in connection with walking the Kokoda trail. He was very happy to have me stay on the station while I did some fieldwork, and undertook to provide a guide and equipment carrier. He also introduced me to "Asterix the Gaul", which became an obsession for a while. My favourite is "Asterix in Britain". Who can forget Asterix telling Obelix to hurry up and finish his beer before it gets cold. But I digress. So, in a few days, I managed to achieve a lot, and was ready to start fieldwork.

Early in July 1969 I was back in the Northern Province, first to climb Mount Lamington and then to start fieldwork in the Kokoda Valley.

Mount Lamington erupted in 1951, destroying the District Headquarters and killing nearly 3,000 people. Ironically it wasn't even recognised as a volcano until the eruption, which consisted of a large explosion and a very high ash cloud, and a number of pyroclastic flows (nuée ardentes) that travelled down the valley leading directly to the District Headquarters and a number of villages. I was accompanied on the climb by three good keen men from the Port Moresby Dental College. We landed at Popondetta and got a ride to Kendata, where we picked up some guides. After about

6 hours walking through rainforest we reached the crater rim where we stayed the night under a canvass sheet. The following morning we clambered to the top of the dramatic lava dome that fills the crater and is about 1,680 m in elevation. Lamington is quiet now except for a few steam vents and a very hot area in the crater.

*The Kokoda Valley, with a DC3 on final approach to the airstrip.*

We knew that there was no water anywhere near the summit so we had some carried up for us by one of the guides. After we had eaten dinner he asked us if we needed any more. Assuming he meant for dinner, we said no, whereupon he took the cap from the container and tipped all the water out! A communication breakdown if ever there was one. So we spent that night, the climb to the top of the dome, and the walk back down without water. The guides cut some sugarcane that helped, although one of the dentists took great delight in telling us that sugarcane is a diuretic and wasn't helping much with our dehydration. Eventually we came to a stream – most welcome.

*The top of the Mount Lamington dome.*

*Our transport from Morseby to Popondetta – a Short SC.7 Skyvan made in Ireland. Mount Lamington in the left distance.*

Our flight to Popondetta was in a Short SC.7 Skyvan made in Ireland. Apparently the Skyvan is nicknamed the "Flying Shoebox", although I thought of it more as a flying brick. It had ridiculously small wings and there seemed to be no good reason why it stayed in

the air. I travelled in them several times, once or twice sitting next to the pilot – a great place from which to see the passing countryside. When returning from Kokoda to Moresby it was common to share the aircraft with bales of rubber. On one occasion there were a few seats among the bales, but no seat belts. I knew in my head that it wouldn't have made a scrap of difference had the worst happened, but it was a most uncomfortable feeling.

After we descended from the top of Lamington my companions returned to Moresby, and I set off for my first research visit to Kokoda – hitchhiking along a road that consisted mainly of mud with the odd log here and there to provide traction. Eventually I got a ride in a large Izuzu 4x4 truck with an Australian timber mill supervisor whose breakfast of gin was obvious when I climbed into his truck at about 9:00 am. Fortunately he wasn't driving. I finally arrived in Kokoda after having to walk the last 10 km.

As an aside, gin and tonic was the iconic tipple of colonials all over the British Empire, including PNG. The preferred tonic was Schweppes, with its gentle hint of quinine. CSIRO scientists, who carried out a number of land systems surveys in PNG, worked out that gin and Schweppes Tonic Water could be used instead of anti-malarial tablets – all you needed was 27 G and Ts a day. But although I like gin and tonic I decided to stay with Chloroquine. I never got malaria, but the Red Cross still turned down my blood when I returned to Australia.

The Kokoda valley, technically the Yodda-Kokoda Fault Trough, is bounded on the west by the Owen Stanley Ranges and on the east by the Ajule-Kajale Range. The valley is drained by the Mambare River, which flows north on the eastern side of the valley. The valley is filled with sediments, mainly from erosion of the Owen Stanley Ranges – we know this because the Mambare River is pushed against the eastern side. I concentrated on a large fan-shaped deposit north of Kokoda, where the Komo River exits the ranges, and found that it consisted of a floodplain plus 3 terraces – the higher the terrace the

older it is. There is 2 m of volcanic ash on the highest terrace and 1 m on the next terrace. The volcanic ash almost certainly came from Mount Lamington and possibly other volcanos east of Kokoda. A colleague who had worked on volcanic ashes in the area, Bryan Ruxton, estimated that 2 m of volcanic ash may have taken 30,000 – 50,000 years to accumulate, so that gives a rough estimate for the age of the highest fan terrace. There are no layers visible in the ash, so individual ash showers must have been thin and reworked into the soil. Bert Kienzle, owner of a large rubber plantation in the area (and a hero of the WWII Kokoda campaign), told me that the 1951 eruption of Mount Lamington deposited about 5 cm of white ash in the area. I was helped by members of the Department of Chemistry and Earth Science. Don Drover was the Chemist and Cliff Ollier was the Earth Scientist. Don did some soil chemistry for me, and Cliff taught me how to make soil thin sections, and the fundamentals of optical mineralogy – identifying and counting mineral grains under a microscope. I published the results of this research in two papers, one on the soils and one on the landform history. And thus began my work on volcanic ashes in PNG.

*Terrace remnants on the fan I studied in the Kokoda area.*

**Port Moresby 1975 – 1979**

After 5 years away I returned to the University of PNG in 1975, first as a Senior Lecturer and then as Chair of the Department of Geography. My staff file number remained the same as when I was there in 1969 – 428. All staff members from gardeners to the Vice-Chancellor were on the same list, and all were represented by the UPNG Staff Association. David Lea, a Senior Lecturer in Geography, was secretary of the staff association and spent some of his time devoted to staff issues including problems with gardeners' conditions.

The Department of Geography was now housed in one of several new buildings that had been built since 1969. We occupied most of the ground floor with staff offices, a staff coffee room, a map store, a cartographic laboratory and several teaching rooms. There was plenty of money for equipment, so we had a well-equipped laboratory for map work and cartography. More serious equipment for chemical, mineralogical and physical analyses of soil and rock samples was shared with other science departments. At one point we applied for a random point generating plate and some random point generators, which progressed well until the research committee figured out we were after a dart board and darts, so we had to buy them ourselves.

Port Moresby had one computer about the size of a small room. There was a connection to UPNG and the more computer literate members of staff used it for their research. Geoff Pickup, a physical geographer, used it for running simulations of stream flow and sediment loads. I well remember him taking delivery of a software program from the United States – 5 or 6 boxes of punch cards.

In 1977 I was elected Chair of the Department of Geography, mainly because I was last to get to the meeting and they held the vote before I arrived. This involved looking after departmental finances, dealing with the day-to-day running of the department, and attending

Academic Board meetings. Even for the latter dress was casual, so I was right at home with my T-shirt, shorts and flip-flops. An Australian term for bureaucrat is “shiny bum”, so for a while I was known as “shiny Pain”.

As in most places T-shirts were a way of advertising shops, companies, groups and places. One of mine advertised Air Niugini, the PNG national carrier, which was launched in 1973 as an alternative to Qantas – the Q on the T-shirt. Qantas described its flying experience as Qantastic, which is what the second kangaroo is saying. The back of the T-shirt showed three koalas in a similar pose.


*Image from: https://vkpeek.wordpress.com/2013/07/24/dont-stuff-around-in-a-q-use-the-air-niugini-connection/*

The main advantage of being Chair was a bigger office and a secretary who stood between me and the rest of the university. She knew that after lunch I was not to be disturbed for at least 30 minutes during which I had a short snooze in an easy chair I liberated from the staff room. My snooze was occasionally interrupted by a man with an anti-mosquito puffer, a machine a bit like a leaf blower. It produced a thick white cloud consisting of diesel smoke mixed with DDT. Whenever we heard it coming we slammed our louver

windows shut to avoid having the offices filled with smoke. All university buildings got this treatment once a month, except the area around the student dining room – there they left out the DDT.

Students and their abilities hadn't changed much since 1969. However, there were more of them, and also a much larger number of courses that needed teaching. One of these was Introduction to Geography, a course that presented the principles of physical and cultural geography to first year students, of whom there were enough to need two lectures each week, the second a repeat of the first. I shared the teaching with Professor Richard Jackson, who was Dean of Arts at the time. We alternated weekly between physical and cultural geography, so one week I would prepare and give the physical geography lecture first while Richard sat at the back and took notes so he could give the second lecture. The following week it was his turn to prepare and give the cultural geography lecture while I sat in the back and took notes. We came to grief with this arrangement only once. Richard was about 10 minutes into his lecture when he was summoned by the Vice-Chancellor on Dean's business leaving me aware of the topic but little more. I must have risen to the occasion because there were no repercussions.

Another course, Man and Environment, was also a team effort with most of the staff presenting lectures on their various specialisations. We started with the Solar System and ended with some detailed case studies of humans and environments in various parts of PNG. In the middle there was one section that we all tried to avoid - the bit on biological evolution. Many of the students came from mission school backgrounds, and a lot of missions were run by fundamentalist groups who taught that the Earth was 6000 years old and that evolution was not true. Every time this section was presented there was unrest in the audience, and some complaints after. Never-the-less we persevered. The Department of Anthropology and Sociology had the same problem and in addition their students concluded that anthropology was about black people and sociology was about white people. All this reinforces the point that I made earlier – the vast

difference in culture and life experiences between the teachers and the taught.

I also taught physical geography to second year students, and geomorphology and soil science to third year students. We shared students with the Departments of Geology and Agriculture, and all in all made good progress. Andrew Wood, a soil scientist from England, and I taught a map reading course that consisted mainly of showing the students how to use topographic maps for landform analysis and for route finding. For the final exam we took them out into the field and dropped them off with a map and a set of instructions on how to find the pickup point. Those who made it passed, those who didn't failed. Simple enough except for one occasion when the class was big enough to divide into two groups. We left the two groups at different starting points and then retired to the pickup point only to discover that we had somehow given each group maps and instructions that were meant for the other group. Not to worry – they all eventually showed up. And passed.

All these lectures meant that I used many 35 mm slides. The more aged among you will remember slides that filled up a carousel on top of a projector – no PowerPoint in those days. I had 100s of slides, many from New Zealand and a growing collection from PNG, that I used to illustrate lectures. After a while I noticed that many were deteriorating as they were attacked by mould. When projected on the screen you could see delicate mould filaments working their way across the emulsion. I mentioned this to Bryant Allen, who advised me to put my slide collection in my wardrobe. This seemed a little odd, but he reminded me that the UPNG staff houses had tiny heaters in all the wardrobes. They were warm enough to keep air circulating, which stopped mould growing on clothes. Of course, it worked for slides as well. And un-exposed film that, up until then, I had kept in the fridge. Mind you, mould wasn't the only hazard faced by slides. Mary-Jane Mountain, a pre-historian, was giving a public lecture on her work in the PNG highlands, when the projector bulb burnt out. The technician replaced it with one that was much too strong, and

Mary-Jane and the audience watched the big screen in consternation as one slide after another melted and burnt.

UPNG, at least in those days, was well aware of the importance of fieldwork in field-based sciences. As a consequence there was a 16-seater bus available for local fieldwork, and we could charter aircraft for fieldwork further away. I often took students on local fieldtrips during a four hour practical class on Friday mornings. For trips further away we organised projects with provincial government organisations, for two reasons. First, the provincial governments needed assistance with various projects and having a bunch of students to dig holes and make observations on agriculture, people, soils and landforms was always welcome. Final reports, based on fieldtrip observations, were written up by staff and submitted to the provincial agency. Second, it gave students a taste of the kind of work they could expect to do after graduation and indeed several ended up working for provincial planning departments.

In August 1976 the Madang Province forestry people wanted us to have a look at a forestry project. Andrew and I set off for Madang to check it out for a student fieldtrip. Like many trips in PNG it wasn't simple. On 14 August we flew to Lae where we were picked up by Ian White, whose role in all this is lost in the mists of my memory, but I think he was a forester on the staff of the University of Technology in Lae. We set off for Madang at midday. Our first incident was the bonnet of the Landrover flying up as we went over a particularly big bump. Fortunately the road was straight at that point so we simply stopped and fixed the problem. We then had a flat tyre a few kilometres further on necessitating a wheel change. After a few more kilometres we came across a UN Toyota Hiace with a flat. They had only just arrived in PNG, and had no idea where their spare wheel was. We showed them where it was (under the back) and then continued on, only to get another flat. The UN delegation caught us up, so Andrew and I waited with our Landrover while Ian went on with the UN people to get our two flats fixed. He got back at 6:00 pm

(the UN vehicle got yet another flat), and we finally arrived at our destination at midnight.

The student field trip was in September, and the objective was to study the impact of logging by the Jant Timber Company on forests on the Gogol River, south of Madang. The logging was being carried out by Jant to supply a woodchip mill near Madang. So on 12 September I met Andrew and some of the students who flew in from Port Moresby. Three of the students had been offloaded in Moresby, another was playing football and yet another just didn't show up. We took the remainder to Gogol and got settled in the forestry camp. The following day we returned to Madang airport to collect the rest, who showed up during the day on various flights from Morseby. We visited the Jant woodchip mill where the logs travelled up a beltway to a chipping machine – each log fell into the machine and after a loud buzz emerged as chips a few seconds later. Perched at the top of the beltway were two local workers making sure that the logs went in straight. They were dressed in shorts and T-shirts, and bare feet. Their one concession to safety was hard hats.

So eventually all staff and students from UPNG and the University of Technology were in one place. Well sort of. While Andrew and I bunked in and shared cooking with the students the UoT staff retired to a hotel in Madang.

We spent the next few days looking at logged and unlogged areas. Logging clearly had an impact, especially in the movement of sediments into drainage lines. However, the tropical rainforest environment is very forgiving, and logging continues to this day with regrowth forests now providing most of the timber. Also it is worth pointing out that in this seismically active area earthquakes cause more damage to forests than logging (more along these lines later).

We ran another student fieldtrip in September 1977, this time to Karimui in the south of Chimbu (Simbu) Province – the Chimbu Rural Development Project wanted information on soils and gardens

in the area. Karimui, on the northern slopes of Karimui volcano, has a tiny airstrip with no regular flights, so we chartered a de Havilland Twin Otter, which with 19 passenger seats was big enough for staff and students. After dropping us off at Karimui the pilot announced that he was going on to Goroka to refuel, and asked if anyone wanted to go. A local man in traditional dress detached himself from the assembled crowd, climbed into the plane, and off they went. The ultimate opportunist hitchhiker. We spent 10 days measuring gardens, noting crops, studying soils and talking to villagers. The main cash crop was cardamom, which was grown under rainforest after the understory was removed. The students all worked hard and there were few problems, the main one being the large number of leeches around. At one point I heard some noise and when I checked, found a couple of students marooned on top of a stump yelling "It's going to jump!" I finally convinced them that leeches don't jump!

*Andrew Wood telling students about soils in a cardamom plantation*.

We organised a single-engined Cessna to take me and a couple of students to Bomai, on the southern slopes of Suaru volcano. There was an Australian teacher there with whom we stayed for a night. He regaled us with tales of his life there, the most interesting being about the annual report he had to send to the Department of Education on Port Moresby. Each year he was provided with a multi-page form that he had to fill out. The first year he completed it faithfully – number of students, number and size of buildings and classrooms and so on. The second year for buildings and classrooms he simply wrote "same as last year". This caused all sorts of problems – the form was sent back with instructions to complete it properly. So he doubled the number of buildings and wrote their dimensions in centimetres. No problem. So each following year he changed the number and size of buildings at random without getting any feedback – clearly the objective was completeness not accuracy.

In September 1978 we took students to the Nembi Plateau, about 20 km SE of Mendi in the Southern Highlands, to carry out similar research, this time at the request of the Southern Highlands Provincial government. In addition to measuring gardens and mapping soils, the provincial government was interested in child malnutrition so we spent some time interviewing parents. The area consists of limestone with narrow mudstone beds, both standing on end to form high limestone ridges separated by narrow mudstone corridors. Volcanic ash blankets all but the steepest slopes. Rainfall is more than 3 m per year, so rain was almost guaranteed during the 10 days we were there.

In the period before the fieldwork Bryant Allen had acquired some aerial photography using a 35 mm camera on a special arm that could be extended out the open door of a single engine Cessna. It was a cold job at highland altitudes so they had to wear winter gear while doing the survey. The whole story is told by Bryant in "And then all the engines stopped" (see the Further Reading section at the end of this book). The highlight was their return to Mendi, when Bryant's offsider, Gary Simpson, almost fell out the open door. The locals, not

recognising a person in the bulky winter gear, thought he was a monkey.

*Part of the Nembi study area.*

So, armed with 1:10,000 scale air photos, we set out to survey the Nembi Plateau. The party consisted of a geographer, an agronomist, a soil scientist, a geomorphologist and a social scientist, plus a number of students. We measured gardens, looked at soils and landforms, and spent time talking with the locals. And got rained on a lot. This made the tracks very slippery to the point where one of the students broke her arm when she fell while negotiating a steep track. This necessitated a trip back to the Mendi hospital. The rain also meant we sometimes had to seek shelter in village houses. The first time this happened Andrew disappeared through a house door, and then reappeared with a startled expression on his face – I had neglected to warn him about the "highland handshake". Some of the old ladies were not above checking out foreign men by grabbing their short and curlies. On another occasion a man produced a sack of

fossil bivalves and wanted to know how how these things from the sea had ended up on his land. We also met some older men who remembered the Jack Hides expedition of 1935, the first white people the locals had seen. Hides shot some people, and this has become part of the oral history of the area. Hides wrote a book about the expedition, “Papuan Wonderland” , and Bryant Allen describes some of this in his story about the monkey. Then there was the agronomist, Mike Bourke. He entertained the locals by dropping carbide into a puddle and then setting alight the acetylene gas that was released, telling them the water was burning.

Some of the gardens were on very steep slopes, up to 45 degrees in places. On one occasion I watched an old man cultivating his steep garden – he seemed to be deliberately digging out clods of soils and throwing them down the slope, to the point where there was a scree slope of soil below his garden. Perhaps this was the objective.

From the abstract of a paper we published on the research:

> A short but intensive survey of subsistence gardens and child malnutrition revealed an area of high population densities where food shortages are occurring in association with extremely low yields from the staple sweet potato gardens. Child malnourishment is associated with larger households and with households with less garden area per person. The major responsibility for gardening falls upon the women who are incapable of maintaining adequate food production in the face of low and declining yields.

The Department of Geography appointed one of the first Papua New Guinean academic staff members, and more were on their way when I left in 1979. But they had their own issues, as illustrated by a very good geomorphology student who wanted to do a field project over a Christmas break. Noki came from the highlands, near Mount Hagen, and belonged to the Yamaga group. The area I had in mind for him

included some Jika territory (one of the problems with natural regions is that they very rarely coincide with political boundaries). Unfortunately the Yamagas and Jikas were traditional enemies, so in the end he did a project near Port Moresby in an area where the people had never heard of Yamagas or Jikas.

Apart from teaching two things kept me occupied. The first arose because of attempts by the University administration to cut costs by reducing staff numbers. The Department of Geography was one of the largest in the university and was seen as a prime target for taking cuts. A formula involving student numbers, courses and numbers of staff was concocted and applied to all the departments. One or two departments had so few students that we had to define a minimum staff number to maintain a discipline. And much to my surprise, and the disappointment of others in the faculty, Geography with a staff of 12 had enough students for an extra staff member. This didn't eventuate of course, but we managed to stay the same size.

The second activity arose because PNG instituted research visas for researchers coming in from various parts of the world. As Chair I passed judgement on relevant applications for research visas. These ranged from expeditions to find the deepest caves in PNG to those who were studying landforms and soils. One I remember was a botanist who ran a business hiring plants to office buildings in New York. In his spare time he followed his main interest – begonias. I spent a day with him in the forests surrounding the Sogeri Plateau, where we discovered to his delight that begonias, at least there, are fertilised by fruit flies. You learn something new every day.

In October 1975 another botanist (Paul Kores) accompanied me on a trip up Mount Victoria, the sixth highest mountain in PNG at 4,038 m. His interest was Rhododendrons. We took off from Port Moresby airstrip at 6:00 am on 19 October 1975 and flew to Manumu, where we organised guides and were on the track by 7:30 am – as I wrote in my notebook, remarkable. The track followed a river for a couple of hours and then started up the longest ridge I have ever walked up – it

took the best part of two days to get to the Esuani grasslands at the top of an unrelenting and very narrow ridge. When there was a tree on the ridge we had to skirt around it by going downslope. We spent one night on the way, in a bush materials lean-to. We reached another bush materials hut in the grasslands at about 4:30 pm on the second day.

During the night there was a frost, so our sleeping bags were useful. We could hear wild dogs howling. These dogs are not village dogs that have escaped, but rather the New Guinea singing dog, sometimes called the Giluwe dog. They are very shy and are related to the Australian dingo; you can find out more about them in Wikipedia. We spent the third day in the grasslands, Paul looking for Rhododendrons and me looking at landforms and soils, some of which had thin layers of volcanic ash that may have come from Lamington. The Komo River meanders through the grasslands and then descends down the mountain flanks to emerge at Kokoda, where I knew it as the river whose fan I worked on. Fortunately the weather remained fine and sunny to the point where my arms got burnt.

The following day we set off for the summit at 7:30 am. The guides took us through the forest, which was low and festooned with bamboo, and then left us when we reached the high altitude grasslands. They were uneasy about the summit area. We continued on until about midday when we reached the first of what promised to be a series of rock walls that I, for one, was reluctant to tackle. So we turned back, reaching the grasslands at about 5:30 pm. Disappointing, especially for Paul, but that's life.

We returned from the Esuani grasslands down the same long ridge, spending the night at the same place we stayed on the way up. Fortunately the guides were able to find some water. On the final day we got separated from our guides – two of them went ahead and two came 10 or 15 minutes after us. At one point we missed a turn and ended up on a very steep slope with no track. Fortunately we were

*Camp on the edge of the Esuani grasslands, Mount Victoria in the background.*

*Esuani grasslands from near the top of Mount Victoria.*

able to clamber back up on to the main ridge where we found the track again, an incident that emphasises the importance of having guides – and sticking with them! Back in Manumu there was a trade store so we had dinner of Flying Wheel brand tinned chicken all the way from the Peoples Republic of China. The following morning we flew back to Moresby.

One visitor to UPNG was a PhD student from Macquarie University in Sydney. Both universities were founded in the mid-1960s, Macquarie in 1964 and UPNG in 1965, and the project was about comparing the two as a way of comparing university progress in two very different societies. This involved interviews with staff and students, sitting in on lectures, and joining us at the University Staff Club, which was open to all staff and students. Those of you from the pre-computer days will remember the envelopes covered in boxes that were used for internal mail – when you received one you read the contents, put them back in the envelope, crossed out your name and wrote the name of the next recipient in an empty box. The student collected these as a way of discovering the connections between different parts of the university.

All universities have their "characters", although not so many these days because universities have become more like businesses than places of learning. UPNG had its fair share of characters, of whom one, Andrew Strathern, Professor of Anthropology, stands out in my memory. He was (and is) an anthropologist of international standing. He and his wife, Marilyn, spent some time living with the Melpa people near Mount Hagen, and became fluent in the local language. Andrew let his beard grow to the point where, about half way down his chest, it separated into two parts. When riding his motorbike around Moresby these two sides of his beard could be seen extending from under his helmet, around each side of his neck, and then trailing in the slipstream.

On 16 September 1975, Papua New Guinea became an independent state after 70 years under Australian rule. In the run-up to the

celebrations there was a great deal of work on roads and gardens to prepare Moresby for the event, and for the arrival of Prince Charles. One of the more important roads was John Guise Drive, which led up to the new Parliament House. Work was so slow that someone changed the street sign to "Melanesian Way", a not so subtle swipe at the tendency for things to take forever to do. On the day the weather was fine, Prince Charles turned up, and everyone had a good time, although I don't think they really knew what they were letting themselves in for.

Normally we had lunch at a café run by the family of one of the UPNG staff members from India. The curries were good. Sometimes for a change we went to the Club Germania, also known as the Virus Club. During an evening function there some of the guests ended up skinny dipping in the pool. Not me – I left that for another occasion, when my neighbour across the street and I held a joint party to celebrate something or other, or perhaps we just felt that it was time for a party. Anyway, late in the proceedings we set up a table and chairs in the middle of the street – no mans' land as it were. Things got happier until we decided to streak around the block, past the security guard house and back to the party. Fortunately the guards must have decided that, since they were there to keep the *raskols* out, not the inmates in, they would ignore us.

This raises the issue of security. In 1969 UPNG staff were housed in various places around Moresby with no concerns about break-ins, although we were warned that if we had a car accident the best thing to do was not stop but if possible drive straight to the nearest police station. By 1975 UPNG staff were mostly accommodated in a housing estate close to the university, with a number of guards. And when I returned briefly in 1980 the housing estate was surrounded by a fence and razor wire. There seemed to be a gradual deterioration in security. Twice I had rocks thrown at the car, one going through the back window and another leaving a large dent in the roof.

Dogs were the pets of choice among most expatriates, but there were some cats as well. This occasioned some fun when newly-arrived expatriates appeared outside their houses calling “puss puss” to persuade their cats in for the night. “Pus-pus” is *Tok Pisin* for, how shall I put this, congress between the sexes, a linguistic circumstance that led to great amusement among the servants in the community. I had two cats at different times. The first was Auntie Jack, inherited from a leaving staff member and named after a character in The Auntie Jack Show, a favourite on Australian TV. Auntie Jack’s signature line was “I'll rip yer bloody arms off!” and that pretty much summed up the cat. She specialised in catching and partially eating snakes, especially taipans, and leaving the tail end as evidence on the front lawn. The second cat showed up one day, and because it looked like Fred, the cat belonging to a neighbour who was on leave, I took it in. However, when the neighbour returned, the real Fred emerged, so I renamed the interloper Phraud. It turned out that he belonged to a local family living nearby. This explained why he turned up one day with his whiskers cut off – this was supposed to keep the cat at home. However, when he refused to go home they said I could have him for a small fee. He was the absolute opposite of Auntie Jack. He showed me his hunting prowess on two occasions, the first when he produced a very dead bird and the second when he brought home a large snail that he would hit from time to time and then wait for it to run away.

I had a rather forlorn garden. One year I grew some peanuts that flourished. However, one day I came home to find them looking wilted. Water didn’t help so I had a look and found that someone had dug them up, removed the nuts, and replanted the tops, a practice known as wombating. There was a large mango tree overhanging the main bedroom that attracted flying foxes when the fruit was ripe. I spent several weeks each year listening to fighting flying foxes and the crash of mangos onto the roof. And my attempt to grow hot chillies in the front garden was successful, except that every morning a pair of birds would arrive, swallow a couple of chillies and fly off. The chillies were so hot that I expected the birds to explode in a

shower of feathers as they flew away. They didn't, although I did wonder if it was the same pair each morning.

The South Pacific Brewery played an important role in parties by supplying kegs. They would deliver the kegs, tap them, and set up a system where the beer came out of the keg warm and passed through a container of ice on its way to the tap. We drank quite a lot of beer – the hot climate provided the excuse and almost every visitor had a few bottles while discussing the gossip of the day. On one occasion a couple of colleagues, Russell Blong and Jack Golson, showed up from Australia and stayed with me. We had a long session that evening and I kept on bringing cold ones from the fridge. I discovered the following morning that one of my guests didn't drink them. There must have been at least six bottles under his chair, each one short by one mouthful. The empties all went back into their boxes and then under the house. After a couple of years the house-girl asked if she could have them. She hired a public motor vehicle (PMV), took them back to the brewery for recycling, and made a good profit.

For a while Andrew and I tried making our own beer, using a beer kit and ingredients we ordered from the Brewcan Company in Cairns, Australia. We mixed all the ingredients in the plastic fermenter provided and waited for 10 – 14 days. We bottled the resulting liquid in 1 litre soft drink bottles after adding the approved amount of sugar to each bottle. We were encouraged by the first batch, so we kept at it. We knew that increasing the amount of sugar increased the alcohol content of the beer so with each batch we added slightly more sugar. This went well until one night after a bottling session I was kept awake by the sound of exploding bottles. This was a hint that we should decrease the amount of sugar.

Bryant Allen, Andrew Wood and I bought a second hand short wheel base Toyota Land Cruiser that in its former life belonged to the PNG Police. Somewhere along the line it had lost all its keys so we used a screwdriver instead. There was a cut-off switch under the dashboard

to make it a bit harder to steal, although I doubt anyone would really have wanted it. We used it to go on excursions out of Moresby. Hood Lagoon, about 100 km south of Moresby as the crow flies when it's sober, was a favourite place. We would fill vehicles with the all necessary supplies and spend weekends camping and swimming. Another favourite destination was Brown River, about 30 km northeast of Moresby. It was a nice picnic place in those days, and on occasions we would take two cars, leave one at the picnic spot and take the other 10 or so km up a secondary road to a place we could launch a rubber dinghy. We would float quietly down the river to the picnic spot, and then pick up the second vehicle before having a BBQ.

Another destination was Motupore Island, where UPNG had a research station. It was a bit small for a full-on earth science research project, but that didn't stop me going there. Bryant Allen and Gerry Ward were conducting an experiment with coconuts, which they put in a cage several hundred metres off the island. The idea was to test how long coconuts could float (up to 218 days) and how long they remained viable (74 days). The general aim was to find out how long coconuts could drift on the ocean and still be able to grow in new locations and in this way throw light on the dispersal of coconuts.

We saw quite a bit of politicians both at the university and at parties. Ministers often came to UPNG asking for advice about their various portfolios, and many attended parties on campus. And some of them started their political careers at the University. Paias Wingti, a final year student in Geography, came to my office one day in early 1977 to borrow the loud hailer we used for student field trips. I loaned it to him, assuming he was going to use it to address students, but he didn't return it until some months later having used it for campaigning throughout the highlands. When he returned it he was a member of parliament, and in 1985 became the third Prime Minister of Papua New Guinea. Most of the campaigning was carried out in *Tok Pisin*, the only language the electorate had in common. I've already mentioned the limitations of *Tok Pisin*, and this came across

in radio interviews. When Iambakey Okuk was asked about the election, he responded “Em i wanpela excruciating experience”.

Government ministers were reasonably frequent visitors to UPNG, both in their formal capacities and socially. I was at a party in 1978 when I noticed a man about my age sitting alone in a corner. I introduced myself, as did he. He was Ebia Olewale, already a government minister, and interested in environmental matters among other things. We talked a lot that evening, and afterwards he made a couple of quiet trips to my office at UPNG to discuss environmental issues of concern. Other government ministers also called on UPNG staff looking for advice and opinions – there was a genuine feeling that UPNG had much to offer the new government.

There were lots of interesting research problems around Port Moresby, and my notebooks are full of observations of landforms, soils and sediments from various places in the area, often collected during student fieldtrips. Not to mention hundreds of photos. Road and building construction also provided exposures of the materials that make up the landforms of the area. However, I postponed work around Port Moresby on the basis that I could do it if funding dried up, and meanwhile I could continue working in other parts of PNG. This is indeed what happened and several potential projects fell by the wayside, although there were two I was able to follow up.

The first started off as a pilot project for work on the coast north of Port Moresby. This was a favourite area for student fieldtrips because we could drive up to Lea Lea in about 30 minutes, and there were plenty of interesting things to see along the coast and in the nearby hills. I worked with Pamela Swadling, a prehistorian who was interested in the settlement history of the coastal area. In a small inlet we found former beaches and sand spits with lots of pottery shards lying around. After examining the area and describing landforms and soils we gave a student class the task of producing a map from air photos and a theodolite survey. The results were published in Science in New Guinea (a journal produced by UPNG) and told a story of ups

and downs of sea level over the last 150,000 years and settlement along the coast from about 2000 years ago. In recent years the prehistory story has been picked up with more intensive research in the area. In passing I note that a large Exxon Mobil LNG Plant now occupies land immediately adjacent to our study area. I wonder if they read our paper when assessing any environmental problems.

The second project was a look at the Sogeri Plateau and the Astrolabe Agglomerate of which it is formed. There are two issues. One is that the plateau is one of a number of flatter areas that occur on the Owen Stanley Ranges both north and south of Port Moresby. These show that before and during uplift of the mountains the area was hilly rather than mountainous and that erosion cut deep valleys and also cut one or a few large plateaus into smaller remnants that are left as small flattish areas surrounded by deep valleys. The Esuani grasslands near Mount Victoria, and the Myola Lakes, are examples. The second issue is the nature of the volcanic rocks that make up the Sogeri Plateau and other small remnants. These, the Astrolabe Agglomerates, are a product of several large and violent eruptions. We know they were large because the layers are thick – several 10s of metres in some cases. And we know there were several eruptions because there are old soils, which take perhaps several thousand years to form, preserved between some of the layers. Finally we know they were violent because they consist of large blocks of volcanic rock sitting in a matrix of fine sand and volcanic ash. Moreover there are horizontal tree casts in some places showing that the eruptions were moving fast enough to flatten trees. They thus appear to be some kind of coarse pyroclastic flows. The age of the agglomerates was not really known until we sampled some basalt from the top part in September 1977. This gave a potassium/argon date of about 5.5 million years, so we can be fairly sure it won't happen again. I published this story in 1983.

So Moresby is safe from eruptions. But this reminds me that Moresby does get earthquakes, although not many. The only one I felt in my time there was on 9 March 1979, around midday. No one

was hurt although the buildings shook and rattled. The only person put out by it was a geology staff member who was delivering a lecture at the time, and when it struck he had just finished explaining that Port Moresby was not in an earthquake zone.

I moved from UPNG to the University of New South Wales in mid-1979, but this was not the last I was to see of PNG.

## Chapter 3. Milne Bay Islands, Mountains and Caves

Milne Bay is the eastern-most province of PNG and includes the pointy end of the mainland plus numerous islands in the Solomon Sea. My first trip to Milne Bay Province was to the Trobriand Islands, made famous by anthropologist Bronisław Malinowski who was stranded there during the First World War (he was an Austrian citizen, so was not allowed to return to Europe for the duration of the war). The weekend in the Trobriands, organised by a travel agent, involved flying to and from the island of Kiriwina in a DC3. The first thing I noticed as I entered the plane was a plaque stating that "This aircraft was given by General Eisenhower to General Montgomery for his personal use during the North African campaign of World War II". It was a very fine aircraft that took us there and back with no trouble, except that the co-pilot had a bit too much to drink on the night before we flew back to Moresby, to the extent that he fell off his chair at dinner. The following morning before we took off I could see him in the cockpit making uncoordinated stabs at various


*I flew in this DC3 to the Trobriands and back. Photo: http://4.bp.blogspot.com/-RwyLOfX9vtY/TmMn50qEJ-I/AAAAAAAAAE0/ecPomLXkVN0/s640/BLOG037.JPG*

switches. Fortunately the captain was up to the task of getting us, and the co-pilot, back to Moresby in one piece. As a footnote, this aircraft ended up on stilts just outside Jacksons Airstrip.

The Trobriands was a good introduction to the islands of Milne Bay, even though it was on an organised tour. We went canoeing, swam in the warm sea, looked at beaches and boats, and visited villages. The latter was my first introduction to yam houses. Yams play an important role in Milne Bay and, especially in the Trobriands, are a big part of community celebrations. I have heard a story, which is true at least for the first part, that the Trobrianders collect fulgurites (sand that has been fused by lightening) and put them in the yam houses to protect the yams from thieves. It is rumoured that the best fulgurites not only protect their yams, but also go out at night and return with yams from other villages.

*Yam houses in the Trobriands. The one on the right, resting on coral lumps, is a good example.*

Most of my trips to Milne Bay were with Cliff Ollier, who was at ANU at the time. We were carrying out research into tectonics and landforms in the area, although we also looked at a number of

prehistoric monoliths and cave burials. Our main basis for obtaining research funding was to look for nice places we had not yet visited, and then to write our applications in much more scientific language.

**Woodlark Island**

Our first trip was to Woodlark Island, out in the middle of the Solomon Sea, in September 1975. It took us three days to get there. On the first day we caught the regular Air Niugini flight from Moresby to Alatau but had to return to Moresby when the pilot couldn't find Alatau because of cloud. On the second day there was no Air Niugini flight so we chartered a twin-engine Beechcraft Baron. I sat next to the pilot and Cliff sat in the back – he falls asleep on all aircraft, big and small, and misses the wonderful scenery so I wasn't about to let him have the best seat. It became obvious that cloud was still a problem. The pilot decided to head south above the cloud until he was sure we were over the sea. He gently descended until we broke through the cloud a few hundred metres above the sea, turned around and headed back under the cloud towards the coast, and then headed east. The pilot had his 1:1 million navigation chart on his knee, and peered out the window at the tiny beaches and capes that were going by. After a while he turned to me and asked "Do you know where we are?" When I said I had no idea he made the wisest decision of the day – we flew back to Moresby. I suspect Cliff slept through the whole thing, and finally woke up on the return flight. Then the taxi we hired to get us back to my house broke down. Finally back home Cliff and I decided to broach the bottle of Tullamore Dew whisky he had bought duty free.

On the third day we took the Air Niugini flight and finally arrived at Alatau at 8:15 am, just in time to miss the plane to Woodlark. So after a bit of messing around we chartered another Beechcraft Baron and got to Guasopa, on Woodlark Island, in the afternoon. Like many airstrips in Milne Bay, Guasopa was built by the Americans during WWII. Of course, Don Neate, with whom we were to stay at Kulumadau, about 30 km from the airport, had met the scheduled

flight in the morning and had long since gone back home. The meant we had to spend the first week in Guasopa. We installed ourselves in the village guest house, which cost the princely sum of $5 per night.

Woodlark Island was a gold mining centre in the 1880s. Apparently it had 20 or so hotels, and a population of over 2,000. It was also occasionally used in the 1930s as a stop on the flying boat route from Sydney to Southampton, and although not central to the Pacific was during WWII, it had a large American camp with accompanying airstrip. However, by the time we got there, very little evidence remained of its former glory.

Guasopa beach is composed of coral sand, with a few bits of grey pumice on its inland side. This pumice must be from a distant eruption, possible submarine. We saw similar pumice on many of the beaches in Milne Bay – I'm sure there would be a story there if someone wanted to collect samples and try to track down its origins. I wrote in my notebook that it was a beautiful spot. That first night there was a full moon, with the soft noise of low waves on the beach and the dull roar of waves on the fringing reef. There were a few mosquitos, but not enough to worry us. The water looked enticing but observations of the locals going out at low tide to take care of their ablutions etc. put us off that idea.

So we spent six days working within walking distance from Guasopa, mostly inland because most of the coast is coral cliffs and almost impossible to follow unless there is a track, which there wasn't. The only track led to a coconut plantation run by Mr Hepai, from Yule Island, north of Port Moresby. He provided us with dinner of bully beef, yams, pumpkin and some greens, and a bed for the night. He was adamant that independence happened far too soon, a view we got from other Papua New Guineans in the far flung parts of the country. The routine fieldwork was broken on another evening with the arrival of a couple on a New Zealand yacht – we were invited on board after dinner for a couple of drinks.

Apart from mapping geology and landforms we found a few small caves. One in particular contained a lot of pottery and human bones – cave burials were a common feature of prehistoric Milne Bay Province. The burials are not looked after by the people there now, and this cave was full of other rubbish such as coconut husks and soft drink cans. Some of the bones were embedded in a stalagmite 40 cm high, so they have been there a while.

On tracks we had to look out for spiders' webs, some of which were built across the width of the track, up to 2 metres in places. The spiders were large – the one on the left is only a centimetre from my hand, so the body was about as big as my little finger. Some spiders eat birds, but I don't know about this one – perhaps a small bird . . . Whatever, we kept an eye out for them after walking unaware into the first web.

At the end of the week Don Neate arrived to meet the weekly plane, and we returned with him to Kulumadau, taking 4 hours on board the M.V. Morua, a reasonable sized boat, and then 15 minutes by truck to his house where we were welcomed by his wife. The Kulumadau buildings are on one of the higher points on the island, which has a volcanic core surrounded by coral limestone. The following day we

set off for Kaurai Lagoon and village, on the northern side of the island and about 15 km away, where we were to spend a few days. We decided we needed a guide and carriers – we had come prepared with small money, and lots of stick tobacco and newspapers. Stick tobacco came in packets about 20 cm square and 5 cm deep. It is tarry cured tobacco that looks remarkably like liquorice. The people shave it then roll it in their hands and then in newspaper to make long thin cigars – it is said that the PNG Post Courier was the most smoked newspaper in the world. In 1975 a couple of sticks of tobacco and a sheet of newspaper could buy a guide or a carrier for a day. We also carried chewing gum for the kids. And we give workers money as well.

We immediately ran into a problem probably restricted to Woodlark – the men wouldn't work for us because they would have to share any gains they got with all the other men in the village. The women apparently didn't have that problem, so we ended up with a man to guide us because he was going to Kaurai anyway, and two women to carry our gear. The latter put our rucksacks on their heads, piled their belongings on top, and off we went. Whenever Cliff and I decided to have a rest – we were after all carrying our cameras – the women would put one foot halfway up the other leg, roll themselves a smoke, and wait while we recovered our breath.

While in Kaurai we spent time looking at landforms, fault angle lakes, and caves. We also surveyed a rather remarkable set of megaliths that formed a number of rectangles, although many of the stones have now fallen over. Most of the stones (the largest we estimated to weigh about 2 tonnes) are beach rock (hard coastal sedimentary formations consisting of various beach sediments, lithified by the precipitation of carbonate cements) and must have required some effort to transport two or three kilometres from the nearest source to the megalith site. The locals had no stories about their origin. We carried out our survey with a compass and tape measure and produced a reasonably accurate map. The site had been

*Our guide and carriers on the way to Kaurai.*

mapped and reported earlier by an Australian patrol officer who, in December 1963, led an Administration Political Propaganda Patrol to the area. His sketch made it clear we were at the same site, but his was oriented 180 degrees from ours, a discrepancy that was explained when we learnt from his paper that he had no compass so had used his wrist watch to measure his directions. This is perfectly acceptable of course, but he seems to have overlooked the fact that in December, when he visited the site, the sun would have been south of Woodlark – hence the 180 degree difference.

The people at Kaurai were very friendly and provided us with more fish than we could eat. At that time they had very little contact with the government. They showed us the village book (most villages in PNG had a book in which visitors, especially government officials, wrote things), and very few people had been there. One comment stood out – "These are an indolent lot."

Back at Kulumadau we spent another day looking around – Don took us to his coconut plantation in a dinghy with outboard motor. My main memory is of sitting by the edge of inlet and getting splashed by water – a bit of a puzzle until I saw the archer fish just below the surface shooting insects out of the overhanging mangroves. From my notebook "The water was clear and as smooth as glass. The mangrove areas were interesting (as always) and the trip back alone was worth it for the spectacular sky – thunder heads everywhere."

On 3 October we were up at 4:00 am to a breakfast of freshly baked bread and coffee, and then onto the M.V. Morua to take us back to Guasopa. I recorded that there was a "beautiful sight as we got up – a waning moon bathed in Earthlight with Venus above and to the left." The weekly plane arrived on time and we managed to get on board – the trick was to know your weight plus the weight of any luggage, which saves the pilot the effort of having to weigh you so he puts your name at the top of the list. Again from my notebook "Moresby at 4:30 pm – not a hitch anywhere!"

We published three papers from the Woodlark Island trip – one on the geomorphology and tectonic setting, one on caves, and one on megaliths and cave burials. I also bought a carved wooden pig, some wooden bowls, and walking sticks, all made from a kind of streaked ebony for which Woodlark is well-known. I still have them in my house in Spain.

**Russian Research Trip**

My next trip to Milne Bay, in December 1976, was an entirely different kind of expedition – on a Russian research ship. The expedition was sponsored by the USSR Academy of Sciences as part of the Man and Biosphere research project of the United Nations. An invitation to join the expedition, looking at small islands in the Pacific, was received by UPNG, and I immediately put my hand up for the leg between PNG and Auckland, New Zealand. This would take 4 weeks but at that time of year there was no teaching so no

problem. David Waite, a member of the Department of Biology also joined, but he was unable take as long so had to get off at Misima, our last port of call in PNG. About a week before we left I got a phone call from a CSIRO staff member who intended to join us in Lae, but the Australian Department of Foreign Affairs wouldn't let him join a Russian ship. However, he was able to join us on Norfolk Island (Australian territory) for a few days. So when I got a call from someone at Foreign Affairs the day before I was to fly to Lae, I was a bit nervous. No need – he was asking whether there was anything he could do to help. Being a kiwi has its advantages.

So on 6 December 1976 we flew to Lae, and joined the R/V Kalisto the next day. The ship, a converted fishing vessel, was based in Vladivostok, and the scientific party consisted of a soil scientist, coastal geomorphologist, botanist, zoologist, ornithologist, and a marine biologist, among others, all led by Yuri Badenkov, a tall and efficient geographer from Vladivostok. There was a laboratory on board, and a number of lab and field assistants to help out. All up, scientists and crew, there were about 40 people on board. David and I were allocated a twin cabin with bunks, cramped but comfortable.


*The R/V Kalisto in Lae.*

My colleagues at UPNG had been ribbing me about my caviar and vodka cruise, and I would have to say there was certainly an element of that. It turned out that when in the tropics every person on board is issued with a bottle of Georgian wine every 2 days. This issue of "tropical wine" ceased when we crossed the Tropic of Capricorn. There was a ready supply of vodka that came in 250 ml bottles with rip tops of the kind that are normally found on beer bottles. This meant that once opened they had to consumed – not that anyone seemed to mind. My notebook tells me that it was smooth and very nice.

*My cabin on board R/V Kalisto.*

On 10 December we set sail. I tend to get sea sick if the bath water is a bit deep so I was grateful that the one and a half days passage to our destination, Bagaman Island, was calm. Things didn't continue that way of course, but after the first week I got my sea legs and didn't notice the rougher weather when it arrived.

We arrived at Bagaman Island around the middle of 11 December. Bagaman is one of the smaller islands of the Calvados Chain, a string of mainly high (continental) islands that stretches east from the tip of mainland PNG. Most have high ridges covered in low forest and small beaches and inlets where the people, if any, live. Bagaman's highest point reaches about 200 m, and its only settlement, Ulubwala, is at the head of a bay just east of this point. The island measures about 4.5 by 3.5 km. There are a few food gardens where the soil allows, and lots of coconuts on low flat ground behind the beaches.

We spent 4 days studying the island, plenty of time for me to map the geology and landforms, and to come to some conclusions about the landform history of the area. Transport from the Kalisto to the island was by lifeboat, and in the early morning as we approached the beach the water around the boat would erupt with flying fish, which would glide above the water for several 10s of metres before plunging in again. Sometimes just as they reached the water they would give a few rapid flicks of their tails and continue traveling in the air. I also made use of small outrigger canoes used by the locals. This was when I discovered the trick of using an outrigger – it seems logical to lean towards the outrigger, but this only results in it sinking, along with you. On the other hand, if you lean away from the outrigger it provides a counter balance and keeps the canoe upright.

Before we left the ship the doctor gave us a lecture about the hazards of working in the tropics, mainly about covering all our skin and avoiding getting sun burnt. Accordingly everyone dressed in long trousers and long-sleeved shirts with ties around wrists and ankles to keep the nasties out. Except me – I persuaded them that shorts were perfectly adequate, and when I returned with the inevitable bites, cuts and scratches that healed quickly with liberal applications of Neosporin, I was briefly known as "tropical man".

I spent the 4 days mapping geology and landforms, measuring dips and strikes in the metamorphic schist bedrock, checking out the thickness of soils, and sampling igneous intrusions for later age

determinations. Most of the island consists of steep valley side slopes, but there are small areas on the tops of ridges that have much gentler slopes and deeper soils. I noted that pigs and pedologists seem to be the main agents of soil erosion. There was also a lot of pumice on the beaches, just like on Woodlark Island. The ornithologist was very excited to find some megapod mounds. These "brush turkeys" are a little odd. Their tail feathers fan vertically rather than horizontally, and they construct mounds of sand, soil and organic matter sometimes more than a metre high. The rotting organic matter provides heat to incubate the eggs, and the adult birds check the temperature from time to time with their beaks. The evolutionary pressures and pathways to this behaviour must be fascinating – a recent paper in the Journal of Biogeography suggests that it developed from nest burrows.

I ended up publishing one paper from this work, with my Russian colleagues. We related the current characteristics of Bagaman Island to the evolution of the Owen Stanley Ranges on Mainland PNG. The highest point in Owen Stanley Ranges is Mount Victoria (see above), and from there the ranges get lower until Milne Bay at the very end of mainland PNG. The Calvados Chain, ending at Rossel Island, is the drowned continuation of the Owen Stanley Ranges. The drowning appears to be a consequence of lowering of the eastern end of PNG by tectonic processes since at least 3-4 million years ago. And on top of this was the post-glacial sea level rise of about 120 m between 20,000 and 8,000 years ago. All of this led to Bagaman Island looking like the top of a drowned mountain, which indeed it is.

On 16 December we left Bagaman Island, and made a brief stop at Bwagoia on Misima to clear PNG customs. There I was able to meet the District Officer in Charge and make arrangements for my next trip with Cliff. Then off to the Solomon Islands, Norfolk Island and finally Auckland, New Zealand, where I disembarked, spent a few days with family and friends, and returned to PNG. I won't go into details but a few things are worth mentioning. In the Solomons we

*Bagaman Island looking east along the Calvados Chain.*

*Kalisto anchored off Bagaman Island – the crew were busy knocking off the old paint and giving it a new coat. My cabin was behind one of the lower layers of squarish portholes*

spent 3 days studying tiny Pio Island, a piece of raised coral that you could walk across in 15 minutes. There wasn't a lot for me to do, but I did manage to catch a small python for the zoologist, who insisted on sharing a bottle of vodka with me. And on the first day I watched one of the crew do his laundry, which seemed to consist of washing

his clothes in sea water and then putting them back on. He also found a pair of trousers well past their use-by date, so he threw them overboard. On the final day, when the marine biologists were bringing up yet another scoop of stuff from the sea floor, they found among their sediments the very same pair of pants!

We left Norfolk Island on New Year's Eve. A great party ensued, with the New Year being toasted, first at Norfolk Island midnight, and then every midnight for a succession of places from Vladivostok to Moscow, which was several hours later. There was also much dancing, my main memory being that it was a bit tricky because when you leapt into the air, what with the rolling of the ship, when you came back down the deck wasn't where it had been when you left it.

**Misima and Beyond**

On 23 September 1977 Cliff and I took off from Moresby at 8:00 am, headed for Misima Island. As with the trip to Woodlark Island there was a great deal of cloud over Alatau, but after flying around in the rain for a while we finally landed at 11:00 am. The flight to Misima left at 1:00 pm and landed about 2:00 pm. I note that most of the flight was in rain and low cloud and that we were at about 450 m above the sea. I also note that it was very gusty at Misima and that the landing was tricky. Hmmm.

Misima Island is cored by metamorphic rocks and fringed by coral reefs. Some of the latter rise up to 300 m, and form terraces along the southern side of the island. It is densely forested and mountainous, the highest point being 1,036 m above sea level. We didn't get near Mount Koia Tau, being restricted by time and access to the eastern half of the island.

We settled in to the guest house at Bwagoia, and met the local expatriate inhabitants – Paul Bourne and Jon Bartlett (OIC), Peter Webb (geologist), Chip Nicholls and Bill Morrison. I can't remember

what the last 2 were doing there. They were all interested in what we were doing, and very cooperative. The following morning Paul took us to Liak, on the north coast, where we organised some carriers and set out for Bwagabwaga on the south coast. Although it was only 4 km in a straight line, it involved a steep climb up to 450 m and a scrambling decent through gardens to the southern coast. The ability of Papua New Guineans to grown crops on slopes of more than 30 degrees never ceased to amaze me. They cut down the trees and arrange the bigger logs across the slope in an attempt to stop soil erosion. Then they plant the crops (mainly taro on Misima), which quickly grow and stop rain hitting the bare soil and washing everything down slope.

*Taro garden on steep slopes on Misima.*

We got ourselves organised at Bwagabwaga, and stayed in one of the village houses. The local councillor delegated one of the village men (Silas) to cook for us. My notebook records that we had “dinner of

soup, and then more soup because Silas tipped the stew into the water cooking the pumpkin! Oh well . .” We spent 3 days in Bwagabwaga before returning to Bwagoia. We surveyed caves and looked at coral terraces, some of them 70 m above present sea level. The caves were all in coral and mainly along the coast. Many contained bones and pottery, and were clearly used for burials, but the present inhabitants seemed unaware of who was involved.

*Skull cave on Misima Island.*

There were one or two caves formed along underground steams. In one we waded through water for about 35 metres. It was decorated with stalactites and flowstone, and full of bats. There were also freshwater crayfish that gently chewed our legs as we waded through. When we reached the entrance on our way out, I removed my hard hat and stood up – right into a short stalactite on the entrance roof. The resulting flow of blood was much more than the slight break in my skin suggested, but a good wash and a bit of sticking plaster fixed the problem.

We had hypothesised that caves might form along the boundary between the coral limestone and the underlying metamorphic rocks – water percolating through the limestone would be stopped at the boundary, and would then dissolve the limestone to form caves. We did find one cave at this boundary, but it was formed entirely in metamorphic rock with a small "window" in the roof where collapse has exposed limestone. It was quite spectacular – the light-coloured limestone contrasted with the dark metamorphic rock, and cave decorations of dissolved and then precipitated limestone stood out starkly against the dark metamorphic rock. With its entrance at the back of the beach, we postulated that it started off as a sea cave formed entirely in the metamorphic rock, which must have been shattered and weak in places to allow the sea to excavate it. The local people knew the entrance but none of them had been into the cave, which was about 50 m from front to back and about 70 m wide. We learnt later that people from the adjacent village, armed with their newfound knowledge of the cave, had sheltered there during a cyclonic storm that occurred 2 months after we left – not a particularly good idea because stormy conditions are probably what led to the formation of the cave in the first place.

After 10 days on Misima on 3 October we flew to Rossel Island via Tagula Island. We were on Tagula for only a short time but enough to see that its geology and landforms are very different from other islands in the Calvados Chain. The small area we saw around the airstrip looked more like a piece of tropical Australia than a PNG island. Then on to Rossel. We landed at Pambwa and were greeted by Victor Arme, from Kairuku in the Central Province of PNG. We stayed in his house that night.

Because PNG has just one time zone, and Rossel is about as far east as you can go in PNG, the sun set very early, and also rose very early. So it was around 5:30 am when I woke to see Victor heading out along the veranda with fishing gear in hand. I went with him to the beach, about 50 m away and watched while he took a smallish hook and sinker, spun it around his head, and threw it out about 20

m. He gave the line a hard jerk, and pulled in a fish about 20 cm long that had got stuck on the bait-less hook. He then attached this fish to a larger hook and sinker and flung it out about 30 m. After a few seconds slowly pulling the line he gave it a jerk, and pulled in a fish at least 70 cm long – that's what we had for breakfast. At that point I decided that, should I ever drop out, Rossel was the place to go. After breakfast Victor took us in his outboard-powered dory to catch up with the MV Pearl, a government launch, on the other side of the island.

We spent a couple of days on the Pearl looking at geology and landforms on Rossel. They turned out to be very similar to Bagaman Island, although on a larger scale. One walk involved clambering up and over a hill to another bay. On the way back our guide said it was easier to go along the beach. This turned out to be a trek through a mangrove swamp, up to our knees in mud. As we emerged from the mangroves we met a man going the other way with a shotgun on his shoulder. His response to our questions about where he was going – "I'm going to shoot a crocodile for dinner". I still think about how we avoided being dinner for the crocodile!

Our trip on the Pearl back to Alatau on mainland PNG, with a brief stop on Tagula, was uneventful, although I was dosed up on anti-sea sickness pills.

**Goodenough and Around**

In September 1978 it was time for another trip to Milne Bay, this time to Goodenough Island. Goodenough is one of the most mountainous islands on Earth, in the sense of ratio of height to width – it is 2,536 m high, and 39 by 26 kilometres across. We went through the usual hassles getting there. Our first try failed. The scheduled Air Niugini flight was unable to land at Alatau because of cloud. So the following day we chartered a Beechcraft Baron, and landed at Vivigani airstrip at around 11:30 am. Vivigani was a big World War II airfield made of Marsden matting, nearly 2 km long. It

is about 10 km from Bolubolu, the government centre. We were met by the DOIC, John Standing, and taken to Bolubolu where we established ourselves in a house belonging to the Catholic church – no electricity, but gas for cooking and hot water. We spent the next week walking up streams into the mountainous interior, mainly studying rock structures. Goodenough is one of a number of gneiss-mantled domes in the eastern part of PNG. These are dome-shaped mountains that are now deeply eroded, but were formed by intrusions of granite that forced their way up through overlying rocks, giving the latter a structure that dips away from the centre of the mountain. They have very distinctive landforms with deep valleys and triangular slope marking the edge of the domes – dome facets.

There were always vehicles going in the direction we wanted. On one occasion we got on a truck with a number of others, including 2 bomb-disposal experts whom we dropped off on the way. As with much of PNG, there is still unexploded ordinance lying around. On another occasion the local councillor took us to the south of the island in a very battered Toyota Landcruiser. This was to look at some extinct volcanos. There was a lot of volcanic ash around but we weren't there long enough to make anything of it. In order to get a better idea of the geology and landforms of the island we organised a climb up into the interior, leaving from a small village north of Vivigani. We left at 6 am and got to the top at 12:45 pm – my notebook says it was 5 ¾ hours of hell. Never mind – we were suitably fortified with very sweet pineapples picked as we passed through a garden near the village. We got back to the village at 6:15 pm. We had finished dinner and organised to stay in the guest house when a tractor and trailer arrived – it was headed for Bolubolu. So we changed our plans and headed back to the comfort of the church house.

Bolubolu was a great base for our work. John Standing went out of his way to help us with accommodation and getting around. We had learnt before our visit that he was keen on Asian food so we had brought a "food package" of such goodies as tinned bamboo shoots

*Dome facet on Goodenough Island.*

and other Asian delights. There was a store run by an expatriate Australian who was happy to open an account for us, although our very first purchase, a bottle of rum, may have made him wonder if he would ever get paid. There were two other expatriates, whom John referred to as the bludgers. They had turned up one day with no visible means of support and proceeded to live off the kindness of others, mainly John as far as we could tell. He was glad to see the end of them after some enquiries about them turned up from elsewhere in PNG, and they flew off after 3 months on the island. There was a beach with brilliant coral just off shore, ideal for a swim to get rid of the daily grime. And while we were there a great ceremony was held to mark the opening of a new government office – traditional dances, and a brass band from Alatau Catholic School that played the Australian and PNG National Anthems, and Silent Night. This was followed by a feast of pigs, chickens and assorted vegetables, the latter dominated by yams.

We made a side trip to Fergusson Island, a bigger island just east of Goodenough. John Standing organised a boat on which we travelled to the south coast of Fergusson. We then walked to the north coast past an area of hydrothermal activity (sulphur vents and boiling water) and a lake. When we arrived on the north coast we met Peter and Patricia, local teachers, who organised the guest house and then dinner – bully beef that we provided, with taro and sweet potato cooked in coconut milk, and taro leaves and leaves from an unspecified tree spiced with chillies. Very nice for somewhere in the wilds of PNG.

We spent 4 days on Fergusson looking at its 2 gneiss-mantled domes, one on each end of the island. We also spent a day looking at granite landforms in the centre of the island. They are very distinctive, with sharp ridges, steep slopes and V-shaped valleys. We published a paper on them in 1981. As in other places, the locals practise shifting

*Steep gardens on Fergusson Island reveal the landforms under the forest.*

agriculture on them, a circumstance that allowed us to see forms that would otherwise have been covered with tall rainforest.

It took us a while to get back to Moresby. On the first day of trying it poured with rain and we spent the morning in John's office waiting for news of the plane that was supposed to pick us up. The flight was cancelled early in the afternoon, so back to our house. On the second day it continued raining and we couldn't get to Vivigani because the road was flooded, even though two planes came and went. We organised a charter flight for the third day, and got to Vivigani at 8:30 am. We spent the day waiting in fine weather, me reading a book and Cliff doing crossword puzzles. When we got bored we watched ant lions, strange little bugs that live in the bottom of small funnels of sand waiting for ants to stumble in. The ant lions help the stumbling by flinging bits of sand at the ants, and devour them when they are trapped at the bottom of the funnel. Late in the afternoon John arrived with the news that the charter couldn't get to Vivigani because of radio failure. On the fourth day we went to Vivigani again, this time having to walk part of the way because there had been yet more rain. Finally we were picked up at 12:30 pm by a flight that diverted from Misima to Vivigani, and then on to Alatau. The pilot cheerfully told us they all knew we were waiting but couldn't do much about it. So we eventually got back to Moresby in the late afternoon of the fourth day of trying.

The last trip Cliff and I made to Milne Bay was in July 1980. By this time I was based in Sydney at the University of New South Wales. Cliff had already spent a week on Normanby Island, and I joined him at Esa'Ala, on Normanby Island, via Alatau – the Air Niugini flights actually connected this time. The flight to Esa'Ala was very hazy – it was difficult to see where the sky ended and the sea began. The pilot told me he was flying a bit higher than usual, and keeping a close eye on the altimeter. A few months later, on a very similar day, he took off from Alatau and was never seen again.

Cliff was waiting for me at the airstrip with Filipe Carbonel, a Spaniard living in Peru, where he owned an air transport company. Cliff had met him on an international flight and told him of all the wonderful things that he could see if he visited PNG. So he did. Filipe was larger than life and among other things was in the Guinness Book of Records for non-stop joke telling – 80 hours at that time although he later broke the 100 hour mark. Cliff reported that Filipe was a big hit with the villagers, and played the guitar for them. One of the women present also played the guitar, and when asked where she learned, she said that she was taught by Maria von Trapp, of Sound of Music fame. And indeed Maria von Trapp and 3 of the Trapp family girls were missionaries in PNG between 1957 and 1965.

Filipe and Cliff joined me on the plane and we flew to another airstrip, Sehulea, on Normanby, near the eastern end. Cliff and I got off, but unfortunately Filipe had to return to Peru. I met up with him again a few years later in Lima.

We had 5 days on Normanby, which also has a gneiss-mantled dome on its eastern end. We spent most of our time around the northern part of the eastern end of the island, looking at caves in raised coral reefs, and the geology of the dome which required some traverses up rivers into the mountains behind the coast. Some of the caves were full of human skulls with a few earthenware pots – we made sure we had permission to visit at them, and didn't disturb anything. We published a paper about the caves, and recounted some of the stories an old man told us about them. There is no point in repeating the stories – they are rambling, seemingly pointless, and illogical. Never-the-less people on the island were always keen to hear them.

The walking track goes along the coast, and in places we had to hire canoes to cross rivers. At one point we met a "dim dim" who turned out to be a member of the Summer Institute of Linguistics. People throughout Milne Bay refer to whites as "dim dims".

*Village and river on Normanby Island. Quite idyllic!*

It was yam season on Normanby Island, which meant that when we arrived in a village we were sat down and given a boiled yam to eat. This would have been OK if they were small, but they weren't, they were about the size of a small football. We managed for the first couple of villages, but after that when we saw a village coming up we would turn off the track and try to sneak past.

In passing, yams are probably more appetising than most tropical starches (rice is really the only palatable one). Sweet potato, with its lower percentage of water than most, is gluggy when cooked in the usual fashion of throwing it on a fire. And sago as produced by the villagers is most unappealing and not to be confused with pearl sago, which I remember as sago pudding when I was a kid. Sago palms (actually cycads) grow in swamps, and take up to 15 years before they flower. The palm is then cut down – the flowering draws lots of starch into the trunk. The pith from the trunk is ground into powder and must be washed several times to get rid of toxins. The resulting

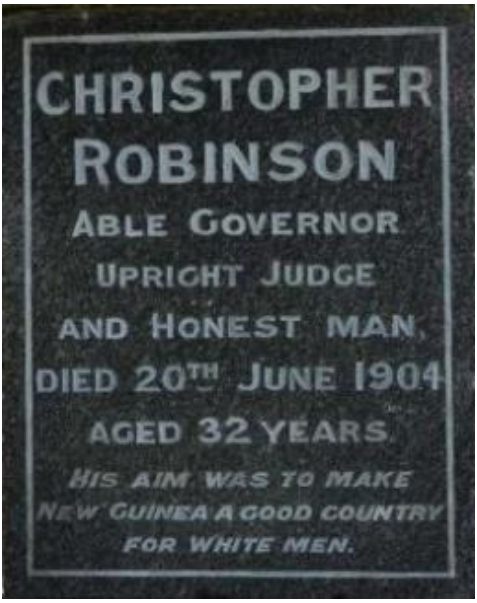
grey sludge is dried, wrapped in leaves, and cooked by throwing it on a fire (a favourite cooking technique). I occasionally wonder how it was discovered as a food. I have this mental picture of a bunch of people wading through a swamp when one of them says "Ooo – I wonder what the inside of that tree tastes like." So they cut it down, eat some of the insides, and promptly get very sick. Nothing if not persistent they, or their descendants, eventually figure out the necessary washing technique. I wonder how many sacrifices were made in the name of culinary science?

We returned to Alatau and spent a couple of days measuring up a cave in limestone near the airport – we later published a paper, mainly about the cave decorations and shape, and including a map of the cave for others who might be interested.

After Cliff left for Australia I organised a trip to Samarai – a tiny island with a big history in that it was the administrative centre for Milne Province until 1968. Its glory days were in the early 20$^{th}$ century when it was a stopping point between Australia and East Asia. However, when I visited it was run down with only a few houses and a trade store. A memorial near the football field was of interest, remembering the "good old days". Apparently it is still there, even in these politically correct times.

My reason for visiting Samarai was not for the island itself but to visit an area on the mainland opposite Samarai. The area was interesting because it is the headwaters of a river that rises only a kilometre from the coast at an altitude of about 70 m and flows north in a gorge through mountains that reach up to 400 m in elevation. In other words the river was there before the mountains – what in geomorphology is called antecedent drainage. The same applies to other rivers in the area. This provided the basis for a publication that described how, about 3 million years ago, the area was flattish and at low elevation with rivers flowing into the sea. It was then lifted up slowly along a fault where the north coast is now. We think it was

slow uplift because the rivers were able to keep cutting down as the land went up.




*Interesting memorial in Samarai.*

We combined all our observations of the gneiss-mantled domes and published two papers on their geology and landform evolution. And thus ended 6 enjoyable and profitable years of visiting Milne Bay and its islands. Parts of Milne Bay Province are beautiful, and largely untouched, especially Rossel, Fergusson and Normanby Islands. They also have more than enough to keep a geomorphologist amused, even though there wasn't much in the way of volcanos or volcanic ash. But you can't have everything.

## Chapter 4. The Papua New Guinea Highlands

James Sinclair has written a detailed history of the PNG Highlands - *Middle Kingdom* (see Further Reading). Published in 2016 it contains a great amount of detail that I found very interesting, having been to many of the places mentioned, and met some of the people involved.

I had many excuses to visit the PNG highlands. The first opportunity came in 1969 when I took advantage of a small grant from UPNG to book a trip to Mount Hagen and Goroka. There was a direct flight, but I chose one that went to Bulolo, Lae, Goroka and then on to Mount Hagen. This flight was in a DC3, quite a large aircraft by PNG standards in those days. There was only one hitch – I was on the "milk run" that involved several stops and took most of the day, while my luggage was on the direct flight from Moresby. The direct flight was turned back by bad weather leaving me without my luggage for the night. Fortunately it showed up the following day.

Anyone who has flown in PNG will know that there is always cloud about. We landed in Mount Hagen in the middle of a thunder storm. On another flight we flew along the top of a cloud layer, and whenever we came to a hole the pilot would peer down to see if he recognised anything. On one occasion he stood the plane almost on its tail – to avoid what I'm not sure. Then he saw the airstrip he was looking for and shot down through a hole in the cloud leaving stomachs 100s of metres behind. The flight back to Moresby was in a DC3 that had no lining in the fuselage, and you could see daylight around the door. Apparently there were some DC3s around with side-saddle seating, but I never saw one.

Mount Hagen and the Wahgi Valley were a great introduction to the PNG highlands and its people. I will never forget looking at one of the men from the side and realising that I could see right through his nose. They made holes in the septum and used it for decorations, often colourful ball point pens, not for writing – they were illiterate. The area also looked very promising for research

*The upper Wahgi valley with the Kubor Range behind.*

into volcanic ashes. Almost every road cutting exposed volcanic ash and buried soils – this was certainly something I would follow up. The climate was also appealing – warm during the day and evenings cool enough to get a good night's sleep.

**PhD fieldwork 1970 – 1971**

I planned my PhD work on the basis of observations I had made in 1969, and discussions with CSIRO staff who had worked in the area in the previous few years. I chose the Kaugel Valley, west of the township of Mount Hagen in the Western Highlands Province. The Kaugel River flows around the eastern side of Mount Giluwe, at 4,367 m the highest volcano in the highlands and the second highest mountain in PNG. CSIRO staff, especially Dr Ernst Löffler, had noted the presence of glacial landforms and deposits on Mount Giluwe, features left over from the last glaciation about 20,000 years ago. They had interpreted terraces in the Kaugel Valley as glacial outwash deposits, and my aim was to relate the terraces to glacial

events on Mount Giluwe, and to other processes that might have led to the current configuration of the landforms in the area.

Having sorted out my PhD topic with my supervisor at ANU (Joe Jennings), I set off for PNG once more. I timed my trip to my thesis area to coincide with a meeting of the Australia and New Zealand Association for the Advancement of Science in Port Moresby, from 17-21 August 1970. In order to attract UPNG students the student registration fee was set at $1, something I took advantage of. I presented a paper on my work in the Kokoda valley.

The trip to the Kaugel Valley involved flying to Lae, picking up an ANU Landrover, and driving up the highlands highway to Mount Hagen, capital of the Western Highlands Province, a trip of 3 or 4 days. While in Hagen I met up with Russell Blong, and together we visited Kuk with Professor Jack Golson from the Department of Prehistory at ANU. Jack was starting an archaeological project on the prehistory of the area and was keen to have a geomorphologist on the team. Russell and I were both interested, but I had a PhD to complete whereas Russell, already Dr Blong, had time. It looked as if Russell and I would cross paths frequently in the highlands.

And so on to the Kaugel Valley, which was first seen by Europeans when Mick Leahy and Ken Spinks flew over in May 1933 in a Fox Moth piloted by Bob Gurney. Mick and Dan Leahy climbed Mount Giluwe in June 1934. And here I was studying the landforms and volcanic ash a mere 36 years later.

On my arrival in Tambul Noel Mathieson, the Government Patrol Officer (*kiap*) arranged some temporary accommodation while I got a house built. He also chose the house site, on the banks of the Kaugel River, and organised some builders, a group from Alkena that had committed some misdemeanour so he got them to build the house as atonement.

Tambul was the main settlement, and consisted of a patrol post, an agricultural research station, and a Public Works Department depot, all arrayed along one side of the airstrip, which handled a weekly government charter that delivered mail, and rare mission flights that served the local missions. There were a couple of trade stores that stocked mainly rice, tins of fish (*tin pis*), and bottles of soft drink (*lollywara*). For anything more than this we had to go to Mount Hagen, which had several stores including a small supermarket, a hardware shop, a vehicle dealer and repair place, a bank and a bakery/coffee shop. And a shop that sold long-playing records for those who had equipment to play them on. I bought a 2-record set of "Under Milk Wood" narrated by Dylan Thomas – rather unexpected in the PNG highlands. There was also a hospital that spent a lot of time delivering babies and removing arrows. Mount Hagen was about an hour's drive from Tambul over a narrow gravel, and in places "interesting", road that crossed from the Nebilyer to the Kaugel River through Mur Mur Pass (altitude 2,750 m). Mur Mur Pass was also one of the main routes for aircraft flying to Mount Hagen from the west because more often than not it provided a cloud-free gap in the mountains. As a consequence it was one of the few roads in the world where you might meet an aeroplane coming the other way.

Building the house required me to provide all the necessary materials. Most of it was obtained locally and came in the form of poles from local trees (*diwai*), cane (*pit pit*) that was woven for the floors, walls and ceilings, and masses of grass (*kunai*) used to thatch the roof and stuff the walls to provide insulation. The *kunai* walls turned out to be a wonderful home for small rats that squeaked and rustled all night. There was also a need for lumber, and this I obtained from a sawmill run by the Seventh-Day Adventist mission at

*Mur Mur Pass road.*

Tomba, on the way back to Mount Hagen. Naturally the mill supervisor wanted to know what I was doing at Tambul. Enthusiastically I told him about my project, and the fact that there were glaciers on Mount Giluwe 20,000 years ago. This provoked a puzzled look, followed by "Don't you know the world was created in 4004 BC?" I responded that the evidence suggested the world was at least 4 billion years old. His parting shot was "Hmm – an interesting controversy". The house took 4-5 weeks to build.

One of my first purchases was a patrol box, the standard way of carrying gear on patrol. The boxes are made of metal and are about 80 cm long by 40 cm wide by 40 cm deep, with a lockable lid. You slip a wooden pole through long handles at each end, and put a man on either end to carry it. A very practical way to have things carried when on walks of several days.

*The house under construction. This is also a good photo to show the usual men's wear – a bunch of leaves at the back and a towel or other cloth at the front, both tucked into a belt up to 30 cm wide made of tree bark. The leaves came from tankets, a cordyline species, and are called* as gras *in* tok pisin. *They got a bit frayed after a few days, but more were readily available because tankets are a common marker of garden boundaries.*

There were some hiccoughs. There was too much equipment to bring in the Landrover, so the ANU contact in Lae was supposed to send it up on a truck. From a letter I wrote at the time:

> "My equipment has still to arrive. [Blank] mucked around in Lae for about a month and then decided to bring it up himself at the end of October. By the time he got off his [bottom] the highlands highway was closed, so he left it in Goroka. This being the case, I am going down there on Wednesday to get it myself. The road has since been opened and I hope it remains open."

This was a fine demonstration of the rather tenuous road link between Lae and the highlands. The Highlands Highway was gravel except where it passed through main towns, and crossed a lot of mountainous country that was prone to landslides. Closure of the road was common, and provided an excuse for shop owners in Hagen to complain about lack of stock and to put up prices. There was a motorbike on sale at the vehicle dealer. During the year I was there it sat in the showroom while its price went up and down depending on the state of the Highlands Highway.

*The upper part of the Kaugel Valley – Tambul on the flat ground below the distant hills. Mount Hagen volcano is the mountain in the far distance.*

One aspect of fieldwork was the weather. The daily cycle went as follows:

Early morning was fine. The Sun lit up the mountain peaks. The peaks warmed up, the air rose and the wind blew up the valleys to the peaks. Rain clouds formed first over the peaks and then spread to the

valleys and by 11:00 am it was raining pretty much everywhere with the wind now flowing down the valleys as the air over the peaks cooled. The rain gradually cleared, first on the peaks and then over the rest of the area and by 3 or 4 pm it was fine again. So I would go out early and work until the rain started and either walk or drive home in the rain. When the rain stopped I would go out until sunset. Being in the tropics, sunrises was always around 6:00 – 6:30 am and sunset between 6:00 and 6:30 pm depending on time of year.

PNG does experience wet and dry seasons. However, my supervisor took great delight in telling me that Tambul and areas further west were in an area that didn't always get a dry season. Luckily there was a dry season the year I was there, although the locals may not have thought it was so lucky because with the dry season came frosts that killed most of their sweet potato crop.

Keeping clean was no problem. The house had a shower cubicle outside, with a shower bucket that had a rose inset to the bottom. You filled it with hot water and hoisted it high enough to be able to get under it. Then you turned the rose to get the water flowing just long enough to get wet. After turning the water off you lathered up with soap and shampoo, then turned the water on again and hoped there was enough left to wash all the soap off.

There were two helpers – Kimbu my field assistant, and Uwa the *hausboi*, both of whom came from the same group that built the house. Kimbu also acted as a kind of guide, although it was surprising how little he knew about areas only a few kilometres from Alkena where he was born and lived. On one occasion we were returning from work, walking to the nearest road where we had left the Landrover. We were perhaps 10 km from Alkena. Suddenly, as we walked past a group of women working in a garden, he dropped everything and ran across to one of the women. There was much crying and talking. After a while he came back and explained that the woman was his aunt, who had left Alkena when he was about 10 to get married. Her family in Alkena had not seen her since – as Kimbu

said, she was as good as dead to her family. He was thus able to take great news back to Alkena. However, this meant that when we were away from Alkena it was important to get local guides – this was usually no problem because they all spoke the same language.

*It was Kimbu's job to clean up the faces of exposures and then hold the tape measure while I measured and described the things I could see. He also made a very good scale for photos.*

I spent the first few weeks sorting out the volcanic ash beds in the valley, and then turned my attention to the materials in the valley, gathering evidence for the geomorphic history of the Kaugel Valley. During this period it became clear that the terraces and other landforms of the valley were not caused by fluvial activity and had nothing to do with the comings and goings of glaciers on Mount Giluwe, in spite of what the CSIRO people said. Instead they were a result of a series of lakes that once occupied the valley floor. Thus all the reading I had done on river terraces and glacial influences turned out to be largely irrelevant. Never mind, that's how it is. If the

evidence doesn't fit your favourite hypothesis (in this case someone else's favourite hypothesis) then the only option is to change your ideas. But my field notes make it clear that I floundered around for a while before I started to piece the story together. I was helped a great deal by the fact that the Kaugel River and its tributaries had cut a trench up to 50 m deep through the deposits, and the walls of the trenches provided wonderful exposures of the materials I was interested in. Ernst Löffler visited me towards the end of my time there, and concluded that I had got the story right, so that was encouraging.

Most of the time I worked out of the house, driving and/or walking to areas of interest, and in this way I covered much of the Kaugel Valley. However, there were one or two places that were a bit further away, particularly at the southern extent of my field area. This involved a 20 km drive and then a 1 hour walk to get to, so I stayed there for a couple of nights. Accommodation was no problem – each area, at least in those days, had a *haus kiap* built especially for the *kiap* when he visited to keep the village births and deaths book up-to-date, and to solve any problems that might have arisen since his last visit. When the *kiap* wasn't there his *haus* could be used by visitors such as me. There were, of course, no facilities so it was necessary to carry all bedding, food etc. There was also a dedicated toilet so I didn't have to share the one in the village.

At 3:43 am on 1 November 1970 we felt a strong earthquake that we later learnt was centred under the Adelbert Ranges, near Madang on the north coast of PNG. I'll have more to say about this further on, but it caused a great disturbance in the Kaugel Valley – the locals were woken by it and their ululations soon filled the air as they called to each other to see if everyone was OK. They have a wonderful way of throwing their voices, and can be heard over quite long distances. The morning after the quake I spotted a man standing on the hill above the house calling out to anyone who would listen. When I asked Kimbu what he was saying, he translated "My pig didn't come home last night. Has anyone seen my pig?"

Which brings me to pigs. They are a very important part of highland PNG society, and much has been written about them so I won't go into details. Suffice to say that they are looked after very well, often sharing the women's house. And the leading men in groups are important not so much for how many pigs they own, but for how many pigs they are owed. The numbers involved can be quite staggering, and represent great wealth. Almost every village has a *sing sing* ground where stakes are implanted against an upcoming pig exchange. Stakes are sometimes planted along roads.

*Several hundred pig stakes in the Alkena sing sing ground, disappearing into the far distance.*

There were a number of expatriates in the valley. Noel Mathieson, the Officer in Charge (*kiap*) was the main Australian Government representative who, assisted by his number 2 *kiap*, was in charge of law and order, making sure the roads and airstrip were kept in good order, and sorting out any problems that arose with the local groups. There was a school teacher from Australia there for part of the time. He ran the school, and also a trade store. Then there was the man in

*During a sing sing each stake has a pig tied to it.*

charge of public works and his wife – his main job was fixing roads, bridges and the airstrip under Noel's instructions. There was a High Altitude Experimental Agriculture station with 2 Australian agricultural officers, one of whom was married. Their main activities revolved around trying out various crops to see if they could be commercial propositions. They spent some time showing the local people how to grow *pyrethrum*, a kind of daisy that produces a major ingredient in fly spray. They also grew strawberries, which made a nice change of diet when they were available. The locals grew some pyrethrum, mainly as a way of getting some money for buying things at the trade store, and for the $5 head tax that was levied each year. They sold the daisy heads and used the stems in their beds to keep fleas at bay.

And then there were the missions. At Kiripia, about 8 km south of Tambul, the Catholic Mission occupied an impressive site on the lower slopes of Mount Giluwe. Father Tony Rössler from Germany ran the mission with the help of a nurse and a teacher, both from

Australia. The church was a large eight-sided affair that was visible from much of the valley. It was built with funds from German parishes, and the centre piece was a large bell that had been cast in Germany and shipped out to Kiripia. The only problem was that it was too heavy to go up on the church, so it was suspended from a post and pole arrangement close to the ground. On the other side of the valley at Alkena, the Lutheran Mission, with two German married couples, was run by Dieter Klemm, assisted by Gunter Oelschlägel (I may have got his surname wrong!) who was an agriculturalist and who assisted the local people with gardens and cropping advice. Finally, just near Tambul was another rather mysterious mission with a married couple who dressed like Amish and who took no part in the local expatriate community. On the only occasion I inadvertently entered their land they made a dash for their house and locked their door.

So there was lots of opportunity for socialising. Noel had a tennis court so afternoon tennis was a regular feature, as was dinner and parties at various houses, involving all or some of the residents at various times. I remember Christmas evening at Alkena when Gunter prepared mulled wine, then placed a contraption over the pot with a sugar cone soaked with schnapps. He set fire to the cone and kept pouring schnapps over it while the burning sugar and schnapps dripped into the mulled wine. A wonderful drink that I have since learned is called *feuerzangenbowle*. Then there was New Year's Eve at Kiripia. We had a great meal followed by liberal servings of Drambuie, Father Tony's favourite – we must have worked our way through at least 2 bottles before midnight. Father Tony organised a bunch of local men to sound the great bell on the stroke of midnight, and had them continue for a long while, the aim being, in his words, to "keep those bloody Lutherans awake".

On 1 and 2 January there was a major *sing sing* at Alkena, arranged to settle a dispute between two local groups. Apparently when Australian law arrived in the form of the first *kiaps*, it was assumed that people were living where they always had. This was not true,

and the *sing sing* and associated exchanges of pigs, cassowaries, kina shells and tree oil were organised to right a perceived wrong. There were at least 1,000 people there, most of them dressed in ceremonial costumes. There was an all pervading smell of pig fat that had been rubbed on bodies to make them shiny, and to keep them warm. Sing sings involve a lot of ritual chanting and stomping around the ground – the first 5 minutes is interesting but it can go on for hours. I took many photos of the ceremony, some of which appear in Andrew and Marylyn Strathern's book *Self-Decoration in Mount Hagen* without acknowledgement. But that's OK.

One group had red hats with two long flexible rods sticking straight up and topped with an oblong and dangling feathers. As they dance, or hop, the rods swing in opposite directions, one left to right, the other right to left, in a sort of counter action. It puzzled me how they got them swinging correctly until I saw one man watching his shadow and jerking his head until he achieved the desired effect.

*The Alkena group (kina shells in the background).*

*Cassowaries and oil in bamboo poles being exchanged.*

*Two of my friends.*

On the afternoon of the second day some dissatisfaction over the amounts of exchange escalated into an exchange of arrows. We returned to Tambul to tell Noel the *kiap*, who arrived to find that the Reverend Klemme had objected to the bow and arrow brigade rampaging through his garden and, after making an unsuccessful appeal for peace, peppered a few of them with his shotgun. Apparently these were the only casualties, the main aim of the whole exercise being to let off steam. I never heard what the eventual outcome was, but disagreements followed by *sing sings* followed by more disagreements seem to be part of the cycle of life in the highlands.

Kimbu was a great help in explaining to the inevitable crowd that gathered around what I was up to as I measured and described sections. I would tell him in *Tok Pisin* what I had found, and he would translate into the local language for the audience. It would have been interesting to have the story then come in the opposite direction to hear what they really thought I was doing. He also became quite adept at recognising volcanic ash and other types of material that I was interested in. The locals at first thought I was looking for worms, to the point where they called me *sinak masta*. This name stuck, even though they learnt from Kimbu that I was really looking at dirt. This led to a deputation one day – their proposal was that I could sit in my house and for a price they would bring me all the dirt I needed. I thanked them for their thoughtful idea, but explained that the where was just as important as the what, which meant I had to go out and see for myself.

In the Kaugel valley, and elsewhere in the highlands, villages weren't really a group of houses like they are on the coast. Houses tend to be built somewhere near a *sing sing* ground, but not close together. There are houses for men and houses for women and pigs. Houses are built on the ground with thick roofs thatched with grass, indoor fires, and no chimneys. The main firewood is *casuarina*, which gives off a thick smoke that finds its way through the thatched roof, and sometimes through the low door – there are no windows. It

is common to see stalactites of *casuarina* gum on the roof poles below the thatch. Mostly the houses are quite small and roughly circular. However, there are also "*long haus*" – houses that are not usually occupied except for times of sing sings when they are used to accommodate guests. After a successful *sing sing* guests are sent off home with gifts, including pieces of uncooked or slightly-cooked pig. This can lead to "*pik bel*" – a kind of food poisoning that can be fatal.

*Long houses south of Mount Giluwe.*

The people also grow their own tobacco, or *brus*. They hang the leaves in the houses to cure, so by the time they smoke it the *brus* has accumulated a layer of *casuarina* gum to add to the flavour. They smoke it using a section of bamboo about 4-5 cm in diameter and about 30 cm long, with a hole at one end for the mouth and much smaller hole at the other end for a rolled up piece of cured leaf. The idea is to fill the bamboo tube with smoke and then suck it all in at once. It certainly has an affect – I watched one fellow go through the

ritual and when he took the final suck his eyes went wide and round and it took a few moments for him to regain his equilibrium.

I made a few side trips away from the work in the Kaugel Valley to see other places. In November 1970 my joint supervisor, Jim Bowler, came up to PNG to visit me and to have an early look at the geomorphic effects of the earthquake I mentioned. I will talk about the latter in Chapter 5, on the north coast. Jim was also keen to see Mt Wilhelm, the highest mountain in PNG at 4,509 m, and the location of an ANU research hut. Wilhelm was certainly on my list, so Jim and I set out for Keglsugl, arriving there at about 2:30 pm after driving up the Chimbu Gorge along a very thin road stuck to the side of the mountains. Keglsugl, at 2,565 m elevation the highest airstrip in PNG, is also the end of the road. From there a 2 hour walk in pouring rain got us to the ANU hut, where we spent the night. The following morning we set off for the top at 6:30 am. Jim unfortunately was feeling the altitude so he turned back after about 30 minutes, leaving me and John Dua, our guide, to go the rest of the way. At the top we were greeted by an APEX sign and a box with a visitors' book. John insisted that I write in it, saying that John Dua had climbed to the top 8 times.

There are many landforms on the mountain that provide testimony to its glacial history, including lakes in cirques that were formerly occupied by glaciers. Even now it gets regular dustings of snow, and there is patterned ground showing that freezing and thawing of the loose soil is still active. My fellow PhD student, Geoff Hope, worked on the vegetation history of Wilhelm and was able to show how the tree line went up and down depending on whether glaciers were present or not.

The following day we left the ANU hut early for Keglsugl and the Landrover. My notes suggest that the road trip back to the highlands highway at Kundiawa was a challenge. It rained the whole time and in places the slippery clay forced us to use snow chains (I had

*Me and John at the top of Wilhelm. Although it is not a difficult climb, there are a few tricky bits where the rocks are slippery, so his progress in his over-sized gumboots put me to shame in my comfortable walking boots.*

wondered why there was a bag full of chains in the back!) even though they were not allowed because they tended to ruin the road. Not to worry, no one saw us, and we removed them as soon as we could. We finally got back to Tambul at about 7:00 pm.

I flew into Keglsugl in 1972, and was impressed by the landing – as we approached the pilot looked out the windscreen and said “I hope that dog gets out of the way!” It is a sloping airstrip, and once on final approach there was no chance to go around.

*On final approach to Keglsugl.*

In February 1971 Russell and I climbed Mount Hagen. We started from Tomba, near the saw mill, and clambered up and back in a day. The area of grassland above the forest is, like Wilhelm, covered with glacial valleys and deposits. At one point we found ourselves deep in moss forest. These forests, usually towards the upper part of the forest just below the tree line, consist of closely spaced trees through which little light penetrates making navigation difficult. Sometimes called cloud forest, the almost continuous cloud cover and cool temperatures encourages moss to grow on everything. In places the moss completely covers the ground, roots and low branches, and in such places you can find yourself walking on a seemingly stable surface that is in fact simply a thick layer of moss through which it is easy to fall, perhaps over a metre, to solid ground. Not a good place to be, so we got out as soon as we could.

My next trip, in June 1971, was to the Sugarloaf plateau, a high (3200-3300 m) partly grass-covered area west of Tambul with Sugarloaf volcanic cone (3900 m) in the middle. This started as a modest plan for me, Kimbu, and a couple of carriers to visit the Sugarloaf cone and surrounding area – a trip of 2 or 3 days. However, it grew. Noel decided he wanted to come with me, and said

he would like to extend the trip so we could go over the plateau to the head of the Marient valley, then head up over the Yabos grasslands to the north, past Lake Rau and on to Laiagam, where he would arrange for road transport to get us back to Tambul. He estimated it would take about 10 days.

We were to meet the afternoon before setting off at a *haus kiap* near the base of the climb up to the Sugarloaf plateau. "Don't worry about carriers or food – just come along with your gear." So I duly turned up with my patrol box full of spare clothes, a tent with sleeping bag, and some equipment I might need. And Kimbu. I was greeted by the sight of Noel trying to organise a mob of people. There was a *kuk boi* (cook), 3 *polis* (policemen) who had rifles, a *tanim tok* (interpreter) and 20 carriers. With Noel, Kimbu and me we had a grand total of 27 people – somewhat more than my original plan. And the carriers had to carry at least 4 days' supplies plus shelter – we couldn't expect to reach any population centre until we arrived in the Marient valley. There was an enormous bag of rice and boxes of *tin pis*, 2 tents and 2 large tarpaulins for shelter, and an assortment of pots and pans. Much of this was carried in patrol boxes with larger items like the rice and the tarpaulins slung on poles. And as Noel pointed out, we were travelling light – no folding chairs and tables for me and Noel.

So the next morning we set off. It took about 5 hours to climb the roughly 1000 m from the Kaugel valley floor to the edge of the plateau. Once we got there Noel sent the men on to make camp while he, Kimbu and I looked at various things of interest to my work. Then we followed the rest to the camp site. As we walked in one of the *polis* raised an Australian flag on a pole – this remained flying until sunset, when it was lowered with due ceremony and salutes from the *polis*. As soon as we arrived the cook served a cup of tea to Noel and me. There was also a large cauldron of hot water waiting for us so we could have a shower in a specially built *ples waswas* (shower place) constructed with poles and leafy branches. After our showers we were served dinner by the cook on the only plates

making the journey – the rest ate their rice and *tin pis* off leaves. This ritual continued for the rest of the trip.

*The carrier line headed towards Sugarloaf.*

We moved the camp closer to Sugarloaf volcano, and stayed there for two nights while I spent time working in the area – lots of interest including peat deposits with thin layers of volcanic ash and, of course, the Sugarloaf volcano and crater, the latter filled with peat. While Noel, Kimbu and I were checking out the Sugarloaf volcano and the area around it, the carriers hunted *karpul* (small rodents) in the area. They caught some to supplement their evening meal of rice and fish. I will never forget the sight of one of the men taking a smallish rat, not cleaned, and holding it over a fire until the hair burned off and the rest was singed here and there. He then ate it head first, bones and all, finally sucking in the tail like a string of spaghetti. Yum yum!

From Sugarloaf we headed west to the Marient Valley where we stopped for a couple of days, getting more supplies and organising

guides for the next stage of the trip. It rained the whole time! Then the morning we set off for the Yabos grasslands and Lake Rau was fine and sunny. Lake Rau is deep and fills a volcanic crater. It was a good place for a swim, but reaching it required walking through long grass with very sharp edges that left small cuts all over our legs – the grass forms its edges from silica, which then becomes phytoliths when the grass dies. Fossil phytoliths can be useful for identifying former grasses but for us they were just a nuisance. We spent 4 nights camped at various places after getting lost several times and eventually being put right by some passers-by. The track led past some saltwater springs that were a source of salt for surrounding peoples. We eventually arrived in Laiagam where I had to organise a lift back to Tambul because a runner had brought me news while we were still near Sugarloaf saying that my supervisor Joe Jennings was arriving in Mount Hagen the day after we were due back in Tambul. I read in my notebook that we finally arrived in Tambul at 10:30 pm after a petrol block, a closed road and a flat tire.

We met Joe in Mount Hagen the following day. Joe was a great wine lover and insisted on buying a few bottles of red from the local store. To his delight he discovered a bottle of Chateauneuf du Pape on the shelf, for the princely sum of $1. Further enquiries produced the rest of the carton from the back of the shop, so he bought the lot. There followed an enjoyable few days during which we looked at my field evidence, and drank wine.

Mount Giluwe, at 4,367 m the second highest mountain in PNG, forms the south-western boundary of the Kaugel Valley, so I was determined to climb it. The opportunity arose in August 1971. My take-off point for the walk was on the road from Tambul to Mendi – there was a high altitude agricultural station at the start of the walk, at 2,750 m, so much of the work of climbing was already done in the Landrover. I organised a guide and a couple of carriers from Tambul, and off we went. Two and half hours later we left the forest and found a bush hut at about 3,300 m, where the guide confessed that this was as far as he had been. Not to worry. We set up camp, and

then had a bit of a look around. The following day we got to the top about three and a half hours after leaving camp. There is a large area of grassland on Giluwe, its extent roughly matching the area of ice about 22,000 years ago. The guide did his best to set fire to the entire grassland. The summit plateau is crisscrossed with tracks both human and small game. After another night in the bush hut we walked back to the road, and thence to Tambul. The walk back was memorable mainly because the guide was cutting off small bushes with his bush knife (machete) at about groin height. This had the potential for great discomfort because I was wearing shorts. And there was a sequel to his efforts to burn all the grass – a few days later, while in Mount Hagen, I was told that people had noticed all the smoke and feared that Giluwe was erupting.

*Looking down the glacial valley we walked up, from the summit of Giluwe.*

Each year there is a big show in the highlands, alternating between Goroka and Hagen. It was in Hagen in August 1971, just after my

trip up Giluwe. I would guess that about 3-400 Tambul men, all dressed in their finery, paraded at the Hagen show grounds. In spite of rain it was a truly remarkable sight, with groups from all over the highlands dressed in their local costumes all parading around the ground. There were also merry-go-rounds with men in *as gras* riding them. Just outside the entrance to the show grounds there was a pile of bows and arrows several metres high and wide – these had been taken from the participants by police to avoid the inevitable excitement leading to an exchange of arrows. I was told that similar although smaller piles could also be seen outside the Mount Hagen movie theatre in the early days. Apparently movie goers with bows and arrows were not above shooting at the screen, especially during westerns when they took the side of the Indians.

*Some of the Tambul contingent at the Hagen show in 1971.*

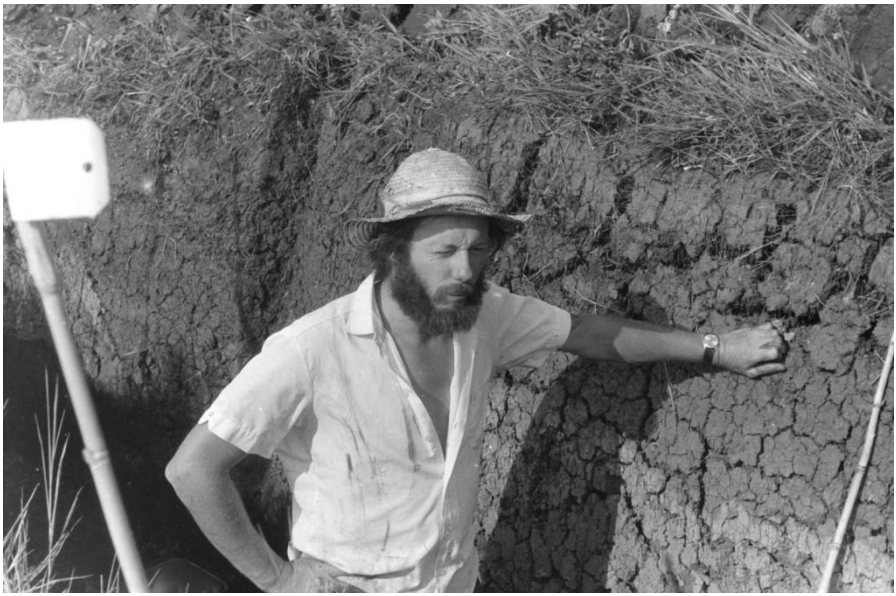
Eventually all this work and fun came to an end in September 1971 when I had to return to Canberra and write my thesis. All in all it was a year well spent.

## Kuk Swamp and the Prehistory of Agriculture

I have already mentioned my visit, with Russell, to Kuk in August 1970 where Jack Golson had noticed some thin light coloured layers of sandy material in the walls of drains dug to lower the water level of the swamp with a view to growing tea. The walls of these newly dug drains also exposed the profiles of numerous ancient ditches. Russell and I agreed that the sandy layers were thin volcanic ash beds. So while I was doing my PhD fieldwork, and later mapping volcanic ash layers across the length and breadth of the highlands, Russell spent considerable time at Kuk and further afield hunting thin volcanic ash layers in swamp deposits in the highlands. I found layers in swamps in the Kaugel Valley, and also on the Sugarloaf Plateau, including in the crater of Sugarloaf.

Russell named the uppermost layer Tibito Tephra, and began the task of mapping its distribution and sorting out its age. While doing this he came across oral history stories about a "time of darkness" when the sunlight was blocked and sand fell from the sky. Our work on the thicker volcanic ash layers in the highlands showed them to be at least 50,000 year old – in fact the latest research suggests 100,000 years – so clearly Tibito came from somewhere else. This somewhere else turned out to be Long Island, off the north coast of PNG, about more of which later. Russell put the oral histories and the geological story together in a book "*The Time of Darkness*" – see Further Reading. The most recent information suggests that the eruption occurred between 1651 and 1671 AD. Russell also persuaded a group of consulting engineers to drill a series of boreholes into a large debris avalanche deposit from Mt Hagen responsible for the presence of low ash-mantled hills in the area, some of which were buried beneath the swamp sequence at Kuk. One of these hills, which emerged as drainage lowered the swamp surface, became known as Blong's Knob. The work that Jack Golson and others carried out there shows that water control and agriculture started at least 9,000 years ago, and in 2008, Kuk Swamp was listed as a World Heritage Site by UNESCO. The full account of the

prehistory of Kuk can be found in the book edited by Jack Golson and others – see Further Reading.



*Russell in one of the ditches at Kuk*

I see in my notebook that Russell and I spent some time watching pigs sleeping and snuffling in hollows in the ground. This is not as silly as it sounds because Jack had identified hollows in a 6,000 year old layer in the swamp that looked remarkably like the hollows the modern pigs lie about in.

Russell also spent some time in the area surrounding Kuk looking at thick sequences of sediment in the Wahgi valley, sometimes with the help of consulting engineers and their drilling rig. The sediments turned out to be similar to those I was studying in the Kaugel valley. We both took undisturbed samples about 20 x 10 x 10 cm in size for cutting sections thin enough to be examined under a microscope. However, before cutting them, Russell persuaded the radiologist at the Mount Hagen hospital to x-ray them, using cartons of beer as the

main currency. This allowed him to see the internal structure of the samples without destroying them. The radiologist was fascinated by the pictures he obtained, and sometimes put Russell's samples ahead of hospital patients. I suppose it made a change from x-raying people to find arrows. I also had samples x-rayed when I returned to Canberra.

All this activity at Kuk meant it was a good place to visit, and although I was only a peripheral part of the team, I was always made welcome and frequently stayed for a day or two as a break from driving along substandard roads looking for volcanic ash. They always needed someone to hold the surveying pole so I was able to make myself useful. And quite apart from anything else there was always a fridge full of beer – SP of course. Russell had discovered that the local branch of the South Pacific Brewery supplied cartons of 24 stubbies at a discounted rate to clubs. He and Wal Ambrose, one of the prehistorians working with Jack, promptly founded the Walrus Club, of which I became an itinerant member. If the secret history of Kuk is ever written, the Walrus Club and its social functions will figure prominently.

One incident stuck in Russell's mind – he recently reminded me of it. Apparently while he was away for a day or two, and after a few beers, Jeremy Smith and I decorated the Kuk guest house with left-over spaghetti draped artistically over various hooks and ledges. We also put some in Russell's bed, an addition that he didn't notice until the third night after his return – we must have had fewer beers that night.

On one occasion a few of us went to the Hagen Park for dinner. My notebook says it was my first time in without being immediately tossed out again. This puzzled me a bit when I read it 40 years later – I didn't think my reputation was that bad. Then I remembered that the Hagen Park Hotel was a posh place that catered for the upper crust of Hagen society – coffee plantation owners etc. This meant

there was a dress code, which my field gear would certainly not have met.

There was a steady flow of people through Kuk, some helping out, others seemingly academic or environmental tourists there with some excuse or other. One young couple became known as Creeping Jesus and Cream Puff because of their appearance and general behaviour. And one young man, who had managed to get everyone's back up, was persuaded to take an empty seat on a flight going to Keglsugl to pick up some team members from a climb up Mount Wilhelm. No-one told him that the plane would be full on the way back, thinking this might be the last we saw of him. But he showed up again a few days later having had a wonderful time and finding his way back by hitch hiking. These and additional characters will populate the secret history of Kuk.

Ian Hughes, then with ANU's New Guinea Research Unit, spent some time asking the oldest members of the local community about their memories of gardening in the swamp. He and his wife Libby lived on the Kuk site for a time, and brought their cat with them from Moresby. When it came time for them to return to Moresby they got a pet-pack from the airline in readiness. However, on the morning of the flight the cat disappeared, so they gave me the pet-pack and asked me to gather it up, should it reappear, as I was returning to Moresby a few days later. On the morning of my departure, lo and behold, the cat showed up and was promptly captured and put in the pet-pack. I checked it in with my other luggage at the Hagen airport and boarded the Fokker Friendship bound for Moresby via Goroka. As we flew down the Wahgi Valley the pilot announced "We are at 10,000 feet. On the left you can see Banz and on the right, Minj." (pause) "And there's a pussy cat roaming around the cockpit". I slid down in my seat and pretended not to know anything. A bit later the pilot announced that the cat was back in its box, the reason we were going in circles was to gain altitude because there are less rocks up there, and we would be in Goroka on time. This should have been the end of it, but oh no. The pet-pack and cat were nowhere to be seen

when I got my luggage in Moresby. I eventually tracked it down in the cargo shed, and returned it to Ian and Libby post haste.

**Chasing Volcanic Ash Layers**

As you may have gathered by now, I have an abiding interest in volcanic ash. I had already worked out the stratigraphy of the ash layers in the Kaugel valley, and was keen to extend this work to a broader area. I must note that the work on volcanic ashes in the PNG Highlands relied almost entirely on the presence of road cuttings because they provided wonderful exposures of the different layers. I also reinforced my adherence to the first rule of road cuttings – once you have explained the materials in a cutting on one side of a road, never turn around and look at the other side. This will immediately throw doubt on your initial interpretations. Your best option is to climb into your vehicle and drive on!

I must have covered well over 2,000 km – the road distance from Lae to Porgera is 650 km, about 500 km of this in the highlands. For this reason I give heartfelt thanks to anyone who has made, or caused to be made, roads in the PNG highlands (in spite of some of the nerve-shattering experiences I had while negotiating them). Road cuttings in the highlands were sometimes works of art. Many of the volcanic ash layers are very stable, and can be made very smooth. After the initial cut was made, in early times all by workers and spades, later by bulldozers, the workers used to smooth them down. They would start at the top, sometimes more than 10 m high, and shave them down to the road level producing a very smooth surface that was ideal for graffiti. The most common adornment was a symbol of two diamonds, one inside the other, which represented the female genitalia.

My first opportunity to pursue volcanic ashes in the broader highlands area came in October – November 1972. In order to provide a wider context for understanding volcanic ash deposits at Kuk, Jack Golson asked Russell and me to collaborate in mapping

volcanic ashes in the upper Wahgi Valley area. So I approached Joe for time off from my thesis, and he gave me permission to go as long as I gave him a draft of my thesis before I left. That is why my first draft took only 6 weeks to write! We unravelled some of the stratigraphy of the thick older volcanic ashes deposited across much of the Western and Southern Highlands Provinces by eruptions mainly of Mt Hagen and Mt Giluwe more than 50,000 years ago.

In order to carry out this work we travelled 100s of kilometres along roads that ranged from OK to awful. We took advantage of a new road being built between Hagen and Mendi, and passing around the southern side of Mount Giluwe. Near Hagen the road was more-or-less finished, and provided us with some wonderful road cuttings that exposed the volcanic ash in all its glory. Closer to Mendi the story wasn't so good. The old road was still available but the new road had the best cuttings. We stayed at one of the construction camps for a few days and were told about some of the problems they had with road construction. They had brought in very large bulldozers thinking to greatly shorten the time needed. Then they discovered that the volcanic ash we were mapping was thixotropic – it turned into liquid mud when vibrated, and their big bulldozers sank into it rather than drove over it. The only vehicles that could always navigate the mud were snow cats, which Russell found a bit incongruous having travelled in them in Antarctica. Nevertheless we covered a lot of ground by hitching rides on snow cats. Staying in the camp was in itself an experience. Most of the equipment operators were expatriates whose consumption of beer was prodigious. There was a scree slope of beer bottles behind the bar. But the food was good and the beds comfortable, so we made the most of it.

As the new road progressed there was a need for new bridges, most of them constructed from steel. We noted that one end of a proposed bridge over the Kaugel River was sitting on a slow moving landslide so we suggested they move it to a more stable location, up or downstream. When we came back a few weeks later they had moved it, but now both ends were on landslides. I am convinced the only

thing holding the river banks apart was the bridge. I will have more to say about bridges – they became the bane of my life on later trips.

*Part of the new road near Mount Hagen with Russell heading down the cutting to study the volcanic ash layers.*

At Mendi we watched an Australian Air Force Hercules landing on the local strip, designed mainly for single or at best twin engine aircraft, and sloping gently from north to south. The Hercules appeared from the north, touched down a few metres from the beginning of the runway, immediately went into reverse thrust, and pulled up a few metres short of the end. It looked like a controlled crash rather than a landing. There being no turning circle or taxi ways, the pilot executed a 3-point turned and trundled back up the runway to a small parking bay. After putting the Hercules to bed the crew all patted its nose, said "Goodnight old girl" and disappeared into the nearby Mendi Hotel.

Russell and I climbed Mount Sigal Mugal on the same trip, accompanied by Jeremy Smith, an ecologist also doing a PhD at

ANU. Sigal Mugal is about 3800 m high and is at the western end of the Kubor Range, south of the Wahgi valley. Its elevation means that the top is above the tree line, and we camped in a small basin formerly occupied by a glacier at about the same time Giluwe was covered with ice. It took 2 days to get there, and I was pretty tired having spent the last 12 months in Canberra without much exercise. Not to worry! We spent a day at the top looking around, Jeremy for plants and Russell for thin volcanic ash layers in peat deposits. The day was uncharacteristically fine and clear with marvellous views in all directions. There was even a brilliant sunset over Mount Giluwe to the west – unusual for the highlands because the sky is usually cloud-covered in the afternoons. And it was cold – the coldest night I spent in PNG. Condensation froze on the inside of the tent, and some wet socks in a plastic bag in my pack were frozen solid in the morning, even though I used the pack as a pillow. And the little waterfall from which we collected water for cooking was an ornate icicle. On our return to Kuk after 5 days away we found that the cold night we spent at the top was matched by the first recorded frost at Kuk, a mere 1560 m above sea level and more than 2000 m below where we camped. No wonder we were cold!

In April 1973 I submitted my PhD and immediately went back to New Zealand to take up a position with the New Zealand Soil Bureau. I thought that my PNG adventures had ended, but somehow I just couldn't get the place out of my mind. This was helped along by the Chief Pedologist in the Soil Bureau, Harry Gibbs, whose son was a Catholic missionary at Porgera. Harry's enthusiastic comments on the volcanic ash soils that he saw around Mount Hagen while visiting his son prompted me to return to PNG, although I'm sure Harry didn't anticipate this unintended consequence of his enthusiasm. So I found myself back there in 1975 – I have already talked about my return in Chapter 2. Now based once more at UPNG, I could continue my work on highland volcanic ashes – among other things.

*Sigal Mugal from the start of the walk – 2 days away.*

In June 1975, shortly after I arrived back in Moresby, Ernst Löffler asked me to accompany him on a survey flight from Mount Hagen. He was in the midst of writing a book on the geomorphology of PNG and needed some photos to illustrate it. I don't have any notes about the trip but I have photos. Ernst chartered a Cessna 180, a single-engine aircraft that was common in PNG – see the photo of Kagi airstrip in the section on the Kokoda Trail. Ernst took the seat next to the pilot and I sat on a low bench in the back. It was a wonderful flight from Hagen almost to the Ok Tedi mine site – the mine itself was a long way in the future. We travelled across the southern highlands and over Lake Kutubu, then along the Hindenburg Wall to Lake Wangbin, returning over Tifalmin and back through Enga Province. Tifalmin is about 340 km west of Hagen, and the flight took more than 4 hours.

Anyone who has flown much in PNG has stories to tell – see the book "And then all the Engines Stopped". I certainly have stories, which I will tell in the appropriate places. There were several kinds

of aircraft. I have mentioned the DC3 and the Short SC.7 Skyvan in earlier chapters. Other common types were the twin-engine Beechcraft Baron, Britain Norman Islander (including the one that won the 1969 race from London to Sydney), the de Havilland Twin Otter, and for very small airstrips single-engine Cessnas. In smaller aircraft there was a flip checklist with plastic tabs above the instrument panel – flip up before taking off, flip down before landing. I can't remember the items (things like flaps, landing gear etc.), but I do remember that letters on the tabs spelt SARWATCH just before take-off and CANCELSAR just before landing – reminders to the pilot about alerting and then cancelling the search and rescue watch. And of course, the note from which the title of this book is derived.

Sometimes it was a bit of a trick getting to the highlands, what with weather and Air Niugini's habit of over-booking flights. On one occasion I recorded my travails on the board in the Geography staff tea room:

| | | |
|---|---|---|
| Day 1 – Flight left early | Air Niugini 1 | Colin nil |
| Day 2 – Flight overbooked | Air Niugini 2 | Colin nil |
| Day 3 – Flight cancelled | Air Niugini 3 | Colin nil |

I assume I was successful on day 4. On another occasion I checked in very early, only to hear an announcement "The flight from Port Moresby to Mount Hagen has been delayed due to operational requirements". This was repeated a couple more times at half hour intervals. Then, in a voice that sounded somewhat frustrated, I heard "The flight from Port Moresby to Mount Hagen is departing late because the aircrew has just woken up"!

In 1969 there were no cabin crew on domestic flights – the aircraft were not big enough. However, when I returned in the mid-1970s Fokker Friendships were used regularly between Moresby and other centres, and these were big enough to have at least one person in charge of the cabin. The safety briefing was given in English in the

usual manner – "In the unlikely event of an emergency . . . ." It was also given in *Tok Pisin*, but much more to the point – "*Sapos balus i bugarup* . . . . ." (*balus* is *Tok Pisin* for aircraft). And in this terminological vein, it was said that *Tok Pisin* for helicopter was *mixmasta bilong Jesus Christ*.

Roads in the PNG highlands were interesting. The main Highlands Highway consisted of gravel-covered road base and was all-weather, although landslides sometimes covered or carried away the road. Less important roads ranged from mud to rock (depending on the geology). Some consisted of mud with two rows of stones roughly the right distance apart for vehicle wheels. Others were made of corduroy, split wood a few centimetres in diameter laid across the road and kept in place by wooden pegs. Most roads were single lane, and sometimes very narrow. On one occasion when Russell and I were crossing from one river valley to another we drove along a ledge so narrow that Russell couldn't open his door, and when I opened mine all I could see was the bottom of the cliff we were on.

Traffic was light and when encountered consisted of 4-wheel drives, usually Toyota Landcruisers, and larger trucks, commonly Isuzu 6 x 6s. I practiced what I thought of as defensive driving, sticking to the middle of the road in the face of on-coming trucks to force them to slow down, but having an escape route in case they didn't. PNG drivers seemed to take the opposite approach. Once I pulled over as far as I could to let a tractor and trailer through. The back of the trailer took off the rear light fitting. I got out and told the driver in my best *Tok Pisin* what I thought of his driving skills. He listened very politely and then said in perfect English "I'm sorry sir, but I thought you were moving." I couldn't think of an answer to that, even in English, so I collected the bits he had torn off, climbed back in the Landrover and drove on.

The bridges were dubious at best. If you were lucky there might be a Bailey bridge over a major stream. However, most bridges consisted of two log stringers across the stream with decking made of bits of

timber and poles, all obtained from the nearby forest. Sometimes the decking was roughly shaped before being nailed to the stringers, but often the bridge builders cut small poles and nailed them on without any shaping, usually with nails that were too short. This had two consequences. First, the decking had a tendency to concertina to the far end of the bridge as you crossed. Second, the round section poles all turned over leaving the nails sticking up and neatly aligned with the tyres. I took to carrying a few planks and a box of 6 inch nails and stopping at each bridge to check it out and if necessary make running repairs. The planks were necessary because bridge decking made very fine firewood and was sometimes partly or completely missing. I occasionally had to cross bridges by gingerly manoeuvring across bare stringers, getting out frequently to make sure the wheels were all pointed in the right direction.

The PNG drivers' way of handling bridges was to go as fast as possible, presumably figuring that the less time they spent on the bridge, the less chance there was of something going wrong. On one occasion I was unable to cross the Lai River bridge because an Isuzu 6 x 6 had come down the hill at a great rate of speed and had failed to pull out, going straight through the decking.

Given passable roads, the other necessity was somewhere to stay the night. The bigger centres had hotels and hostels. The former provided all the necessities including meals and a cut lunch if required. Some of the hostels provided meals, some didn't. Away from the main centres we often stayed at mission stations, the missionaries unfailingly providing room and food for passers-by such as ourselves. And if all else failed we found a *haus kiap*, common across much of the areas we covered. We also occasionally took advantage of school classrooms and sheds on airstrips.

So in December 1975 I was back in the highlands chasing volcanic ash layers. This time, with Andrew Wood for company, I headed east to Chimbu (now Simbu) Province to visit Mary-Jane Mountain who was conducting research into the prehistory of an area near Chuave.

She was later to find that her rock shelter site at Nombe is one of the oldest in PNG, being occupied by humans at least 25,500 years ago. We stayed in a house in Nola village, near the rock shelter, and spent some time looking at soils and volcanic ash layers. The whole area is limestone with very steep slopes and lots of sinkholes.

One of the sinkholes near Nola was a home for thousands of flying foxes – it was about 15 m by 30 m wide, so quite large. Mary-Jane told us that on one of her fieldtrips the villagers decided to gather flying foxes for the main course at a big party. They spent several days building a kind of bridge out from the edges of the hole until there was only a small gap through which the flying foxes had to exit each evening. On the appointed day they put a net over the small hole and caught as many flying foxes as they could, and proceeded to have a big feast. I have no idea what flying fox tastes like, but it doesn't seem very appealing.

Andrew and I spent several days mapping volcanic ash layers in Simbu Province, including some trips to the south of the Wahgi River, where the roads are narrow and traverse steep limestone and mudstone ridges. On one of our trips we followed a very narrow road, watching with growing apprehension the fuel gauge getting lower and lower. When we reached the junction with a slightly more important road near Kundiawa, and fuel, we were confronted with a drop of about a metre – road workers had fixed the Kundiawa road and hadn't bothered to level the junction. So we spent some time with spades digging a ramp for us to get from one road to the other. And the bridge over the Wahgi River was an interesting affair of Marsden matting suspended on seven lengths of wire rope that swayed when we crossed, with a sort of bow wave preceding us.

After leaving Nola, Andrew and I spent several days mapping volcanic ashes east of Mount Hagen. We stayed in various village houses, and with people, mainly agricultural advisors with whom we wanted to discuss soils and land use. One of these, Jur Bekker, his wife Haru, and their two children, from Canada, put us up for a

*Bridge over the Wahgi.*

couple of nights in Olubus in return for much discussion about the soils of his project area. When we left Olubus we were joined by an old man who remembered Jim Taylor visiting the area in 1933 on the famous Wahgi patrol with Dan and Mick Leahy. We continued mapping volcanic ashes, ending up at the eastern border of Simbu Province. We went back to Tambul so Andrew could see the area. We were also looking for suitable places to take students. We stayed at Alkena in the *haus kiap* and had a reunion with Kimbu and various others who had helped during my PhD fieldwork. My notes suggest that I decided to leave well alone in the Kaugel valley to avoid contradictions! Then on to Mendi, again looking for student fieldtrip possibilities.

I was back in the highlands in February 1976, this time with Russell Blong. We concentrated on the eastern highlands, travelling down the highlands highway to the Markham/Ramu valley, a tectonic depression that runs from Lae westwards to the Indonesian border

and beyond. The highlands highway reaches Kassam Pass at about 1500 m and then drops down along a very wriggly route to the Markham Valley nearly 1000 m lower but only 7 km away in a straight line. We drove down into the Markham Valley and then west towards Madang for about 40 km. We didn't find any volcanic ash in the valley, but we did drive through a locust swarm, not a real problem except that the air vents on the side near the pedals were open and I ended up with a bunch of angry locusts up the legs of my shorts.

We based ourselves at the Country Women's Association hostel in Goroka while we worked in the Goroka Basin, mapping older volcanic ashes beds in road cuttings and thin more recent beds in swamps. Russell was also collecting legends of the time of darkness, so we spent some time talking with villagers, particularly older men who had a fund of oral histories to draw on. We climbed Mount Michael, almost due south of Goroka and at 3580 m an impressive and isolated peak east of the Kubor Range. The mountain was named by Michael Leahy and Michael Dwyer, who were the first outsiders to pass by in 1930 and who named it after themselves to commemorate their joint expedition.

At 3580 m the top is above the tree line so we found swamps with Tibito Tephra in the peat. The night was spent in a bush hut made from nearby shrubs and covered with a tent fly that we carried for that purpose. It is very pleasant on mountains like this in PNG, if it isn't raining or cloudy. On the way up Mount Michael we could hear singing frogs – a rather strange ethereal sound. There was lots of stinging nettle. Our guides took the leaves and rubbed on their legs – they said it made them strong. It certainly kept us on the move although I doubt it was because it gave us extra strength. Our trip back to Goroka was punctuated by a thunder storm, a common occurrence in the highlands but this one blew down a couple of trees over the road. Fortunately they were small enough for us to drive over in our 4WD. Because the CWA Hostel didn't provide meals we ate at the Bird of Paradise Hotel.

I was back later in 1976 to continue mapping the volcanic ash. For some of the time I was accompanied by Roger Parfitt, a soil scientist from UPNG who was interested in what happens to volcanic ash as it weathers and changes from its original composition to other minerals. We were using the UPNG Toyota long-wheel base wagon, quite suitable for the roads. Its one problem was the tail gate. Earlier models of this vehicle had a winding handle for lowering the rear window to allow the tail gate to be opened. This one had an electric motor operated by a button on the dash board. Predictably the first thing to fail was the tail gate electric motor, so access to the back of the vehicle was through the side doors. Most inconvenient. Even more inconvenient was the night we stayed in the cargo shed at Omkalai airstrip. The shed was made of corrugated iron and the continuous rain all night drowned out the noise of someone breaking into the wagon and stealing our spare wheel. Fortunately they left the ones already on the vehicle.

Omkalai airstrip is carved out of the side of a mountain, so it provided good exposures of volcanic ash. It slopes at about 7 – 9 degrees, and the views are spectacular, looking across the Wahgi gorge with the river about 400 m below the end of the airstrip. So although the roads were somewhat harrowing, the views made up for it.

After Roger left I tackled the road south to Agotu, past Mount Michael and on towards Crater Mountain, another of the highlands volcanoes. The road was very thin, often sloping towards the edge of the mountainside, and there were very sharp bends, some of which required backing and filling in the Landcruiser. Every now and then I had to stop and clear rubble from the road so I could get past. Agotu was the end of the road, so I stayed there in a mission guest house (the missionary was away) and did some work around the area. The following day I returned to Goroka. In notebook I say that the road was not as bad as I had imagined in the dead of the previous night. I also saw other wheel tracks so concluded that all was OK, until I realised they were my tracks made on my inward journey the

*The Wahgi Gorge looking east down the Wahgi River from Omkalai airstrip.*

previous day! Nevertheless it was all worth it. From my notebook: "The country south of the highlands highway is spectacular. The Wahgi, then Tua, gorge is a great gash cut through the mountains".

I stayed on mapping volcanic ashes across the highlands until the first week of October, first around Goroka and then the Wahgi valley while based at Kuk. Just before I went back to Moresby I spent a day at Tambul with Jack Golson and Phillip Hughes. In early 1976, during drainage of a swamp at the Tambul High Altitude Agricultural Experiment station, a wooden spade had been found. Martin Gunther, the station manager, had stored it by burying it in wet ground. Jack and Phillip wanted to describe the site and collect the spade because it was very similar to wooden artefacts they were recovering at Kuk. I went along because I was familiar with the site, and had drilled holes in the swamp as part of my PhD work. We found the spade and the site, and Jack and Phillip recorded it during

*The Agotu road – it looks a lot better in the photo than it did from behind the wheel.*

what Jack described as “appalling conditions of cold and rain”. The spade turned out to be about 4000 years old, yet more evidence of very early agricultural activity in the PNG highlands.

I made another trip to the highlands specifically for mapping volcanic ash, at the end of 1977. I based myself at the Kimininga Lodge in Mount Hagen – cheap with good meals. And a public phone that returned all your coins when you hung up, so I could call Australia at no cost (this was long before the days of email). The news got around, so there was a queue to use it. Eventually the telephone people found out about it, but it took several days for them to fix it. My days consisted mainly of driving along roads both big and small looking for suitable road cuttings and describing the layers of volcanic ash. Road works and collapsed bridges foiled some of my attempts to get off the beaten track. And it frequently rained. Rain was a pest for fieldwork because it hampered proper study of road

cuttings. Almost every site looked at during rain had to be revisited when it wasn't raining. From my notebook:

> At Poroma I had to wait about 30 minutes for the rain to stop. Then on the way back to Mendi there was a big thunderstorm. I was standing in the middle of the Lai River bridge (one of the few steel bridges in the highlands) when a bolt of lightning struck a tree nearby – no a good place to be I decided.

Every now and then I would encounter masses of people all dressed up in their finery going to sing sings and other gatherings. On a couple of occasions I went back to the Kaugel valley and stayed with Father Toni at the Catholic mission for a change of scenery. One evening at the Kimininga Hostel I had dinner with Pius Wingti (he of the Geography Department loud hailer – Chapter 2) and two members of the Western Highlands Province Area Authority. One of the latter had been part of the group that built the house in Tambul in 1970. A few days later I stayed in a United Church hostel in Mendi. As usual the welcome was sincere and the food good. My notebook records that they were an interesting lot – very concerned about the welfare of the local people, yet spent the evening planning to move their operation from Mendi to the bush nearby – this would save them having to pay the fixed urban wage to their sawmill workers. Then a few days later I stayed with Peter and Angela Sharp in Laiagam, northwest of Hagen. He was the Chief Medical Officer at the Laiagam hospital. His main tasks, he said, were delivering babies and taking arrows out of people. He had a visiting surgeon for a while, and reported that "She was a real keen cutter".

I visited the Kandep-Marient area that Noel and I passed through on our June 1971 trip. The basin is at about 2400 m altitude, and wet and cold. I stayed at the Catholic Mission. Russell had told me of meeting the priest on a flight to PNG, but couldn't remember his name – something like Father Christmas he said. So when the door opened and I was greeted by a figure in a white gown with flowing

white hair and beard, I almost said “Father Christmas?” He turned out to be Father Casimir, who had just returned from his native Poland. He pulled me in out of the cold and gave me a tot of Polish buffalo grass vodka to warm me up. This was entirely appropriate because it was the favourite tipple of the hero in the book I was reading at the time.

The following day was one of those that stick in the memory. I set out along a road west of Kandep. It wasn’t hilly but there were lots of dubious bridges, and at about 2:30 pm the inevitable happened. I crossed one of those bridges where the planks roll over and put nails through the tyres and got two flats. I had only one spare at that stage, so I sent a note back to Father Casimir. He arrived with a tyre repair kit and we fixed both flats. On the return trip I got three more flats on another bridge. More repairing of tyres meant that we didn’t get back to the mission station until after dark. Time for some more Polish buffalo grass vodka.

While I was working on the volcanic ash Andrew Wood was doing fieldwork for his PhD thesis on subsistence agriculture, soil fertility and ecosystem stability in the Tari Basin, west of my western-most site at the Tari Gap. Bryant Allen was also there working on gardening systems and nutrition. Their base had a sign above the door “We the pukawe surveys. Fugwas a specialty”, *fugwa* being the local word for swamp. I made a couple of trips to visit Andrew as I was his PhD supervisor while at UPNG. He had found some of the same volcanic ash as I had further east. He also demonstrated his mastery of swamps while I was there, taking a long run-up and magnificent leap to clear a drain full of mud, only to land face-down in it, with his hat slowly floating off downstream. That’s how fieldwork goes sometimes.

I also did some work with two members of the PNG Geological Survey, Chris Pigram and Gary Arnold. Together with Russell we worked out the landform history of the Wahgi valley, applying knowledge of the volcanic ash layers to get an idea of the sequence

of events that led to the present landforms. In one of those "isn't it a small world" coincidences Chris became my boss about 30 years later at Geoscience Australia.

**Enga Rural Development Project**

In April 1979, just before I moved to the University of New South Wales in Sydney, I was invited to Wabag in Enga Province to take part in discussions that would lead to a loan application for an integrated rural development project. Various people were present for the talks, including members of the Enga Provincial authority, Department of Primary Industries staff, representatives from Placer Minerals who were exploring for gold at Porgera, and missionaries. The later included Father Phillip Gibbs, also from Porgera, the son of Harry Gibbs who was Chief Pedologist at the New Zealand Soil Bureau when I worked for the Bureau in the mid-1970s. Bruce Carrad and one of my former students, Kundapen Talyaga, were leading the project.

In addition to much discussion there was some fieldwork to get an idea of soils and other physical planning elements. One day we were on a back road when we came to a collapsed bridge. Some of us walked while the drivers took the vehicles to our destination by an alternative route. This was all well and good, but another bridge collapsed while they were crossing it – see my comments about local drivers and bridges above. All in all not a day to demonstrate the best driving qualities of our Enga government-supplied vehicles and drivers. My notes say "The driver of our vehicle is a raving lunatic. Tomorrow I will drive the UPNG vehicle – I'm certainly not taking on the roads around here with a PTA driver!" In passing I note that one of the first lessons you learn when confronted with local drivers is to insist on doing the driving yourself. If that fails, hope for the best and never ever look at your watch – this will be interpreted as a sign that you are in a hurry.

In the event we all survived, and Enga Province was granted a loan to carry out a rural development project. My flight out of Wabag was memorable – the pilot was worried about low cloud obscuring his view of the ground. When he caught a glimpse of the ground he did a steep banking turn to get below the clouds near Tomba – we emerged from the cloud very close to the tree tops and flew just above the ground to Hagen. This turned out to be unnecessary because Hagen airport was fine and clear of clouds. He crashed the following week doing the same thing.

On that note I left UPNG and went to a new job in the School of Geography at the University of New South Wales.

In late 1979 the expected invitation came from the Enga Rural Development Project team, asking me to prepare maps of the soils of Enga Province. I'd been at UNSW for only a few months when the invitation arrived. I went to discuss it with Jack Mabbutt, Professor of Physical Geography and Head of School. He listened to me briefly and then started telling me how UNSW could not afford to have me traipsing off to PNG whenever I felt like it. I interrupted him with the news that it was all being paid for by the Enga Rural Development Project. It is one of the few times I have heard someone start a sentence saying no and finish it saying yes. So off I went.

At that time, Enga had few roads and a lot of country that could be reached only by walking or by helicopter. Fortunately the project could afford some helicopter time so we made the most of it. On a trip to the far west of the province we landed in the middle of the village of Paiela, the only flat piece of ground. As we came in the wash from the helicopter blew down a house. Oops! However, the villagers were so pleased to see someone from the government that they forgave us, provided lunch and promised much cooperation with the project. I also managed to get a helicopter to take me to the far east of the province, which is at a much lower altitude. This proved to be an essential part of the soil survey, allowing me to make observations and collect samples from otherwise inaccessible places.

And although my main task was to prepare a soil map I also made observations of volcanic ash layers and was able to fill in some blanks.

*The helicopter in Paiela village.*

When I visited the Porgera mine site, at that time still in the exploration and proving stages, the Placer Company allowed me to use their Bell 2-seater helicopter when it wasn't being used to deliver drill strings to sites perched on the side of a mountain. I spent a couple of days there, hitching rides when I could. Usually this involved going on a drill string delivery flight, and then heading off somewhere for soil work. In order to deliver the drill strings the helicopter had to hover over a drill pad on the side of a very steep mountain with the rotors only a few metres from the cliff. A bit scary but I got used to it. One reason for Placer's generosity was that they were interested in obtaining vegetables locally and wanted advice about nearby areas with suitable soils. I was happy to help and

provided maps and information, but I don't think anything came of the idea.

*The little Bell helicopter that took me to the eastern Enga Province.*

Driving continued to be exciting. The road to the mine camp was always a challenge being carved out of mudstone and having no surface covering. I remember sliding down one side of a gully and getting half way up the other side before yo-yoing back and forth until I was stuck at the bottom.

Russell later did some work on the landslides and land stability in the area and concluded that the rocks were about as unstable as any in PNG.

Bridges continued to be no fun at all. One day I came to a bridge with some decking but about 2 m of bare stringers. While I was contemplating the situation a local came along from the other direction, so I guided him across the bridge expecting that he would return the favour when he got to my side. But oh no – as soon as he

*The road where I yo-yoed to a stop. In the pouring rain.*

was safely across he put his foot down and disappeared in a cloud of diesel smoke and spattered mud. So I carefully lined my vehicle up with the bare logs and with many stops and starts to check on where the wheels were I got across safely.

There was a particularly challenging bridge near Pogera airstrip on the road out to the mine. I had spent a bit of time nailing the decking down, but on one crossing the decking gave way and I ended up with both front wheel springs resting on timbers on either side of the hole, and fresh air between the wheels and the torrent below. Normally with 4WD and low range I could have backed out, but when the decking gave way the back of the vehicle bounced and ended up too close to the edge of the bridge to go backwards. While I was cursing my luck and PNG highland bridges, a villager came along. He suggested that I take off the wheels, which would allow me to put some wood to replace the decking that had broken. Then all I had to do was put the wheels back and drive on. We discussed this for a

while, with me pointing out that the new planks would prevent me from putting the wheels back on. However, he had the germ of an idea. I sent him off to get some more planks, which he nicked from a nearby fence. Meanwhile I put the jack under the front bumper and lifted the front of the vehicle so that the wheels were higher than the decking. We slid the new planks under the wheels, I lowered the jack, and all was well.

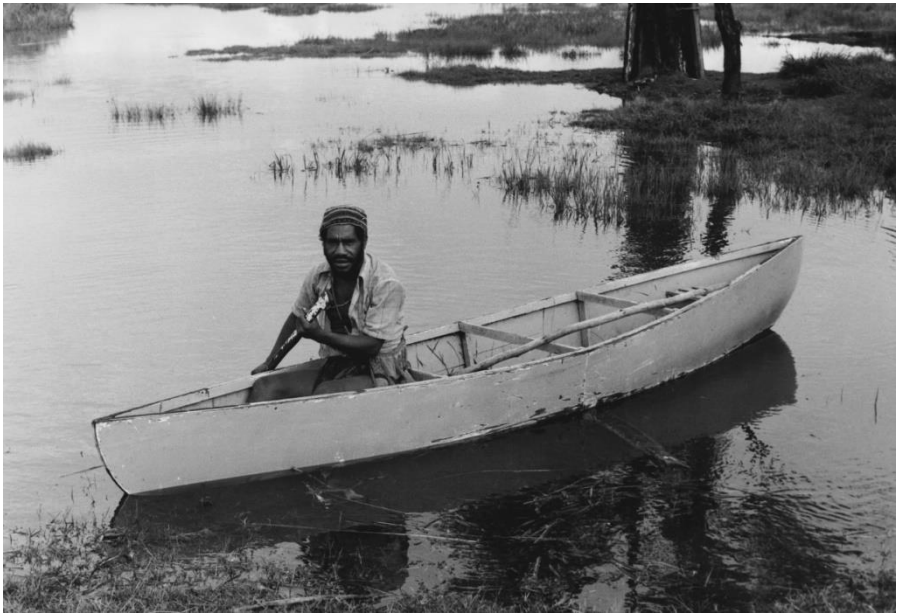
On the way back to Wabag, a trip that should have taken about 5 hours, I was stopped by two landslides. The first one involved a two hour wait for a bulldozer, which cleared the road in about 10 minutes. The second one was nowhere near a bulldozer so I shouted out from the road until some local men arrived. They immediately rounded up some more men and shovels and cleared enough room for me to get by. This took about 3 hours, so a 5 hour drive became a 10 hour slog.

*The joys of travelling on the Enga Highway.*

My final expedition took me back to Kandep. Father Casimir was away so I stayed at the Lutheran Mission with Gary and Linda Teske, who were part of the initial project discussions in 1979. While I was there Gary had a christening some distance from the road so I went along, taking the opportunity to see some more of the land and soils for my report. While the christening was going on I wandered up a nearby hill, looking at soils and landforms. I got back in time for the celebratory feast – pig cooked in an earth oven. Gary and I were presented with the prime cut – the belly. It consisted mainly of fat with thin layers of meat, and was virtually uncooked. I ate it, as was expected, and suffered no ill effects. Gary left me there so I could do some more soil mapping and I ended up walking back to the mission station mainly through swamp water and mud. And of course it rained – Kandep must be the coldest and wettest population centre in the highlands!

Unlike most highland valleys, Kandep has no deep outlet so it frequently floods. As a consequence it is not always possible to reach the western side by road. There was a footbridge at the outlet but that was at least 10 km from where I wanted to be. So someone suggested I take a canoe! This was a bit unexpected but I was game, although the canoe looked like one I made as a kid and that promptly sank when I embarked on a voyage on the farm dam. So we set off at 8:20 am, first out to the main river, then downstream and across a lake to the western edge, arriving at 9:30. My notes tell me that only the main river was dirty and that the lake and swamp water was clear. At the main river we passed a foot bridge that emerged from the water and arched over the river to disappear again on the other side. I didn't get any photos because I had wrapped my camera in a plastic bag to protect it should we tip over. Also, I was attempting to keep as still as possible and spent some time watching my life flash before my eyes. But we made it, although we had to walk the last few hundred metres through knee-deep water and flooded grass.

*The Kandep valley in flood.*



*The canoe – not very big, and looking unstable.*

I stayed in a little house attached to the school at Titip. The next morning I wasn't feeling at all well – sore throat and stuffy head – the only time I got sick on my travels in the highlands. But help was at hand. There was an aid post with a "*dokter-boi*" at nearby Kinduli where I was able to get some aspirin. After doing what work I could I returned to Titip and went to bed. My notebook records the following day:

> Got up at 7:00 am with no real choice but to walk. Set off at 7:15 feeling not so good, and got steadily worse. It was not helped by reports that the water at the causeway [where we hoped to cross the swamp] was, variously, chest high, shoulder high, over our heads. We had in fact decided to go to the rope bridge when we were told there was a canoe at the causeway. This turned out to be *giaman* [untrue] but I was relieved we went that way because I don't think I would have made it to the rope bridge. The water turned out to be only belly-button deep, so no problem. I then pushed on with the lads to Kandep but gave up the struggle there and sent a note to Gary. Linda came along about an hour later, Gary being tied up with *lotu* [church].

A quick look at the walk on Google Earth suggests it was about 15 km.

I went straight to bed, suitably dosed up, and was all but better the following morning. I asked Gary if there was anything I could do to repay their hospitality. I was returning to Wabag that day, and he suggested that I could deliver some cargo, plus the Bishop of Kandep and his family, to Irelya Lutheran Mission Station just outside Wabag. I was happy to do this, and I don't think anyone minded when I stopped to collect some soil samples on the way. I duly delivered people and cargo and then returned to Wabag.

*The rope bridge at the outlet from the Kandep valley – the river flows over solid rock. These bridges look easy to use but they require a bit of practice. My natural reaction was to put a lot of weight on the "hand rails" but when you do the bridge threatens to turn upside down. You must put all your weight on the narrow foot plank.*

After a couple of days in Wabag I drove back to Hagen. Driving down the Enga highway I could see smoke in the distance. As I got closer I could see houses burning, and people fighting. Arrows were arcing over the road. Now what, I thought. But as I approached they put their bows on the ground and gave me a cheery wave. After I passed I could see in my rear mirror the fight resuming, with more arrows arcing over the road. And thus concluded my final trip to the PNG highlands. Once back in Sydney I prepared maps of the soils of Enga Province and wrote an accompanying report. I also wrote chapters on geology, landforms and soils for the main project report.

Enga people, like most in the highlands, have elaborate and generally efficient methods of gardening. They plant sweet potato (*kaukau*) in

mounds just as they do around Hagen and in the Kaugel valley. After harvesting the mounds are dug out into circles, and weeds etc. allowed to grow for a few weeks. The mounds are then reconstructed with all the weeds buried in the middle. This provides very good compost and because it has been practiced for thousands of years has also had a substantial influence on the soil.

*PNG highlands gardens.*

One of the main problems facing some parts of the highlands is that increasing population growth has put great pressure on soil resources and the ability to grow enough food. In a draft report on population and agriculture in Enga Province Bryant Allan noted that the behaviour of Enga drivers might provide a solution by causing a decrease in population. In the event he was dissuaded from including this in the final public report. I approached it from a slightly different angle. From a letter I wrote to New Zealand Soil News in 1983:

> Recently, while searching for information about the effects of agriculture on soils in Papua New Guinea, I

came across a paper that roundly condemned shifting agriculture. The author put the case that shifting agriculture (SHAG) was ruining hundreds of square kilometres of otherwise productive land. However, much research in PNG suggests that SHAG is probably the only way of carrying out agriculture in some parts of PNG. The fragile soils in the low altitude but mountainous land where SHAG is mostly carried out need long fallow periods between cropping for soil nutrient levels to build up again. Increasing population pressures mean shorter fallow periods, and less build-up of nutrients. It is the decreasing fallow periods, not SHAG as such, that threaten continued agricultural use of large areas of PNG.

In many highland areas an alternative to SHAG uses land much more continuously. This is sedentary tillage under fallow free conditions (STUFF). The nature of the highland environment, not least the soils, combined with the tillage practices of the highland peoples, allows for much shorter fallow periods. However, even here increasing population pressures lead to eventual soil fertility decline, so STUFF can equally threaten long-term agricultural production.

Given the above it seems that PNG's subsistence farmers are on the horns of a dilemma – it is either SHAG or STUFF. Increasing population pressures, moreover, strongly suggest that alternatives to SHAG and STUFF must be found before it is too late.

This led to a series of letters to NZ Soil News that became known as the great shagging and stuffing debate.

# Chapter 5. North Coast Earthquake and Volcanoes

## The Madang Earthquake

My first visit to the north coast of PNG was a follow-up trip after the magnitude 7.0 Madang earthquake, which occurred at 03:43 a.m. local time on 1 November 1970. Jim Bowler visited Madang shortly after and took a flight over the area worst affected by landslides. He and Joe decided it was worth further study, so I was given the task, and time, to take a trip through the Adelbert Range, the area with the most landslides. So in early January 1971 I flew from Hagen to Madang to talk with local officials and to visit the area on foot. The Assistant District Commissioner (ADC) was particularly helpful. He took me to a meeting of the Local Council responsible for the Adelbert Range, where most of the landslides had occurred. The councillors all assured me that they would help as much as they could during my patrol through the area. On the way back to Madang the ADC told me that they asked for reports of damage and losses. One man reported the loss of gardens, pigs and houses, and then got up to go. At the door, as an afterthought, he said "Oh, one of my wives died". The death toll was 9, and there was considerable loss of gardens and houses, as I was to see first-hand.

The following day I organised supplies and arranged transport to my departure point, Baitata, where I stayed the night. I organised a couple of guides for the whole trip. The plan was to employ carriers from villages we passed through, and that worked well because the councillors had arranged just about everything. My notebook tells me there were plenty of mosquitos about – just as well I had a mosquito net. During the 10 days I was in the bush it was very useful not just for keeping the mozzies at bay but it also provided me with a semblance of privacy. I could write notes and read without getting disturbed by the inevitable audience – I knew they were there but I couldn't see them, and that made all the difference.

The ten days were spent walking from village to village observing and measuring landslides. Many walking tracks had been destroyed so it was hard going in places. Landslides had removed trees often on both sides of mountains so the ridges were narrow and exposed. Each village had a *garamut* (drum) made from a hollowed log about a metre long and "played" by pounding it with the end of a short pole. They have a low booming note and are used as a form of communication between villages. The routine was for each village to announce my arrival and then departure with much pounding on the *garamut*. Where they could the villagers kept me well supplied with food, including breadfruit, which I hadn't tried before. It was very nice, and in the words of one of the guides, "*Winim aiskrim*" – better than ice cream. They always found me a place to sleep, sometimes in a house newly built after the earthquake. In the most severely affected parts the landslides had destroyed gardens and also water sources. In one place all they had to eat was coconuts, and brown coloured water came in bamboo poles from some distance. I was able to dig into my supplies of rice and tinned meat and provide a meal. I kept a record of where these were so I could report back to the ADC who was on the lookout for places that needed help.

I found that the most pleasant part of the day was sitting and exchanging stories with the villagers in the early evening. It was cooler, we were all fed and, if there was water nearby, clean. All the rainforest bugs and beasties were making their various noises, and occasionally a cassowary boomed in the distance. On most evenings thunder would herald rain – you could hear the sound of rain on the forest coming like a waterfall, at first muted and then getting louder and louder until suddenly the village would be under a deluge for 15 – 20 minutes before it receded into the distance. In one village I was accommodated in a partially built house, on stilts. During the night a bunch of pigs moved in below me and I was woken every now and then by their snuffling and snorting as they all tried to be in the middle at the bottom of the pile – it was quite cool at night, especially after rain. And although most of the houses were on stilts up to a couple of metres high, a few of the new ones were built on

the ground to avoid collapsing entirely if there were another earthquake.

*Landslides behind a ruined village in the Adelbert Range.*

I mentioned mosquitos. Leeches were also a problem, with up to 10 each day attaching themselves to my legs. One afternoon I found a particularly big one, full of my blood, which I removed and threw on the edge of a fire. A piglet quickly appeared and ate it, so the blood didn't go to waste.

Some of the councillors went out of their way to help. One produced a mattress and pillow from somewhere, together with a kerosene lamp and a radio. He also dug me my own toilet! At another village there was an old man who had just arrived. He apparently had been born there but had left many years earlier to work for the government, and had ended up in Samarai, in Milne Bay Province. He still wore the regulation black uniform given to government workers. When he heard about the earthquake he decided to return. However, he spoke only *Tok Pisin*, having forgotten the local

language, and no one could remember him – all his generation had died. He had tried in a vague sort of way to take charge of the village, and although the locals were having none of that, they took him in and made him welcome. He kept everyone amused with his tales of the *tumbunas* (ancestors).

*My guides and carriers with one of the councillors (with the badge on his shirt). This photo also shows my patrol box.*

At one of the last villages I stayed, the counsellor and I had a long talk. He produced a map of the north-eastern part of South America, and wanted to know where different countries got their money. In his words "*As bilong dispela kantri i wanem*?" – what is this country based on? So I told him and the assembled mob as much as I could, in *Tok Pisin*, so it surely left a lot to be desired. After the geography lesson he harangued me and the mob on the reasons PNG didn't need self-government. There are not enough educated people, he said, and there are no real export industries owned by local people [*Mipela nogat factori, bisnis i kan pulim mani long narapela kantri*]. Because

of this, all business, and therefore most money, is controlled by Europeans who get most of the export income and who consume most of the imports. Money from Australia goes on things like schools and roads that don't earn money. Self-government must be based on money and business, and Papua New Guineans had neither, except for the tiny amount of wages they were paid. He had clearly spent a lot of time thinking about it and was very worried. I wasn't able to offer any advice, but we parted the best of friends.

The day after my lesson in PNG economics we walked to the coast. I wasn't exactly sure where we were until I saw the Plantation Hotel, a great place to end the trip. I and my two guides got a lift with two Australians in a Development Bank Toyota Landcruiser back to Baiteta, where we left the guides, and then on to Madang. On my return I stayed with "Docker" Reid, a forestry officer who lived in Madang. They threw a party that evening, not for me I must add, although I did provide some entertainment. I'm not sure what caused it, but I passed out while bending over to get myself the first beer of the evening, landing flat on my face. The only damage was that the plastic frame of my glasses snapped in two between the lenses.

Docker's wife, a nurse, insisted that I see a doctor, so I found myself trying to explain to a young English doctor who had arrived in PNG that morning that I may have been bitten by a few too many leeches while walking through the Adelbert Range. He seemed fascinated by the whole story, wanting to know if the leeches might have somehow entered my body and was I bleeding from any orifices? In the event, I was declared fit and well the following day so was able to carry out the rest of my fieldwork.

The main task for my remaining few days was measuring the flow in the Murnass and Gilagil Rivers and collecting water samples to calculate the sediment load. The Murnass River caused me a slight problem because the water was filled with sediment and was completely opaque. I waded across, stopping every 2 m to take a reading of water speed. I could see logs floating down by the bits that

stuck out of the water, and waited for them to pass before continuing. However, at one point I tripped over a submerged log and went completely under the water, except for the hand holding the electronics of the flow meter. The electronics were safe, but when I surfaced I could hear the shrieks of sympathetic laughter coming from my helpers on the bank.

*The Murnass River near where I was submerged briefly.*

On my return to Madang after my unplanned ducking I was greeted by Docker head down and bottom up in the freezer. It turned out he had this habit of coming home in the evenings with a fresh carton of beer that he put in the freezer to quickly cool off. The result was a 15 cm layer of frozen beer and broken glass that he was attempting to clean out before his wife came home from a few days in Moresby.

Jim Bowler and I published the results of his reconnaissance and my footwork. Landslides were about 40 – 50 cm deep, and we later estimated from my measurements and the sediment loads in the

rivers that it was the equivalent of removing 11 cm of soil from the whole Adelbert Range land surface.

**Long Island – Source of the Time of Darkness**

After chasing Tibito Tephra all over the highlands Russell and I got the opportunity to visit its source, Long Island, in 1976. Russell and I flew to Madang from Mount Hagen and met up with Chris McKee from the Vulcanological Observatory in Rabaul. Chris had organised our transport to Long Island where we had two objectives, first to map the various volcanic ash layers on the island, and second to sample them together with any organic material we could use for radiocarbon dating. Russell was particularly interested in the most recent eruption, the one that produced Tibito Tephra and the legends of the time of darkness.

After a day and a half in Madang buying supplies for our journey, we boarded the MV Barena and set off at 9:20 pm. My notes tell me the Barena was "50 feet of tub". It took us 14 uncomfortable hours to get to Matapun, on the western side of the island. We were all seasick at different times. I got it over and done early and managed to get some sleep on the deck near the stern. It was a great relief to arrive in the lea of the island as we approached Matapun village.

We spent 10 days on Long Island. Most of the time we were on the coast, walking between villages and going up streams leading inland. We also visited Lake Wisdom in the middle of the island. Long Island is about 30 by 20 km in size, and has a lake in the middle that measuring about 8 by 10 km. Lake Wisdom occupies a caldera formed when the island collapsed after a large eruption, probably the one that produced Tibito Tephra. There is a small island, Motmot, in the lake, a result of renewed volcanic activity. We measured and described volcanic ash layers and collected samples for analyses and dating. The volcanic ash layers were formed mainly by pyroclastic flows that must have travelled very quickly down the sides of the volcano, giving inhabitants no chance of escape. Human bones and

pottery fragments have been found beneath the most recent flows. There were also horizontal tree trunks in places showing that the flows knocked trees over as they passed. These trunks provided great samples for radiocarbon dating as we were able to obtain the outermost tree rings to get material close to the time of the eruption.

Long Island is beautiful, both on the coast and inland. We stayed in villages when we could, rather than on the boat. Lunch was usually tinned meat and biscuits, and a coconut either from a village tree or washed up on the beach. The latter were sometimes quite old, and full of a sort of spongy textured flesh plus the "apple" – very tasty. There were fresh water springs everywhere to slake our thirst. We saw hundreds of frigate birds, and turtles laying eggs on the beaches. The Barena was assigned to us all week, and it turned out that they expected to feed us as well. So, taking advantage of some flour he found in the galley, Russell made damper one evening. Chris and I enjoyed it very much, and it was a change from tinned food and biscuits. The Barena transported us around the island as we moved from one village to another. The crew always had lines out with hooks covered in green leaves – large fish seemed to find them irresistible. We saw dolphins, and on one trip a sail fish. My notes record "What a marvellous climate – haven't worn a shirt for days. Haven't washed either" – hmm. I assume I meant in fresh water, because the sea was nice and warm for swimming.

We spent one day visiting nearby Crown Island, a much smaller volcanic island with no history of eruptions about 12 km north of Long. We wanted to find Long Island ashes, which we did. We also saw lots of lizards sunning themselves on the beach. One or two of them were digging up turtle eggs. And right on the water edge there was a large rock that had been used for grinding stone tools covered in elliptical depression up to 50 cm long. For lunch one of our guides caught some large mud crabs and cooked them in a giant clam shell we found on the beach. A good day was had by all (except the crabs).

*Kiau village on Long Island.*

All good things come to an end, so Russell and I found ourselves back on the Barena for the overnight trip back to Madang. This time it took just over 10 hours, without the unpleasantness of the outward journey. The following day we hired a van in Madang and drove up the coast to Bogia, about 4 hours. Along the way we looked for volcanic ash but didn't find any. There were a number of rivers without bridges, but easily negotiated fords. The only problem was that the air vents low on the front of the van were stuck open, and at one ford, a bit deeper than most, the front of the van filled with water. The following day we took a trip to Kranket Island, just off the coast of Madang. Here we found about 10 cm of Tibito Tephra sitting on raised coral.

We published a couple of papers on the volcanic ashes and eruptions on Long Island. Russell followed this up with exhaustive work on the age and distribution of Tibito. For example, William Dampier sailed past this area in 1700, and Russell was able to establish that profiles

*Russell filling the front of the van with water. Fortunately the engine was at the back.*

of Long Island drawn by Dampier match well with the present profile, showing that the major eruption must have occurred earlier than 1700. Later he was able to say, in the words of geochronological science, that "Our best estimate places the eruption between 1651 and 1671 AD with a 95.4% probability and between 1655 and 1665 AD with a 68.2% probability."

**Karkar Island – Another Active Volcano**

In November 1977 Chris McKee and I visited Karkar Island, which is about the same size as Long Island. It also has a caldera (actually two, one nested inside the other), but much smaller, higher and with no lake. And there is an active cone within the smaller caldera. Fortunately there was a regular air service so we could fly in. We stayed with Roger and Rosa Middleton, who ran a number of coconut plantations on the island. Their hospitality was a bit wearing

– late nights with drinks and films. Roger was full of stories – one I remember was his tale of driving home in the early evening when he saw a log lying right across the road. He got out to move it, but when he got to the front of his car it had disappeared. His explanation was that he had seen a python with its tail in the grass on one side of the road and its head on the other.

Chris was there for 4 days, and I stayed for 10 days – Chris had to return to the Rabaul Vulcanological Observatory. While Chris was there we visited the edge of the inner caldera to see what activity, if any, was taking place. The cone was steaming away, but there was no eruptive activity. After Chris left I travelled around the island mapping and measuring volcanic layers, and collecting material for radiocarbon dating. The situation turned out to be very similar to that on Long Island. There is a road right around the island so with Roger's organisation I didn't have to do much walking, and stayed with managers on his various plantations. However, the best exposures were up rivers, so I spent a lot of time walking up rivers, mostly dry, looking at the banks and recording what I could. On only one occasion did I have any trouble. I was walking along a river bed minding my own business when a large wasp buzzed out from the bank, stung me on the hand, and disappeared back into the forest. I let out a yell and flung my arm up. My geology hammer, slippery with sweat, slid out of my hand and went straight up. So there I was with a very painful hand and a hammer with a sharp pointy bit somewhere in the air above me. Not knowing which way to go I crouched down with my other hand over my head, and the hammer fell just in front of me.

On the flight back to Madang I sat next to the pilot and persuaded him to fly around the top of the island so I could get an aerial view of the caldera. He enthusiastically complied and made several circuits, including one below the caldera rim. I got a wonderful view but, sadly, no photos. The only other passenger was an older woman from a mission sitting in the back and every time we banked to get a better

view she shrieked “Ooooh”. I think she was glad when we finally straightened out and headed back to Madang.

*The active cone on Karkar. The wall of the inner caldera forms the background.*

We published the results of our trip. Later, Russell was able to link at least two of the thin ash beds at Kuk to Karkar, on the basis of their mineral content and chemistry. Karkar is a younger version of Long Island and can look forward to similar devastating eruptions. As Chris and I said in our paper, “In view of the fact that Karkar volcano is in a mature stage of growth, the risk of large eruptions is possibly greater now than at any time in its history”.

There was a tragic sequel to this work. About 15 months after my time on Karkar, in early 1979, Rob Cooke, Chris’s cousin and Head of the Rabaul Volcanological Observatory, visited me in Port Moresby to discuss a volume of papers on PNG volcanoes that he proposed to edit and collate. Russell was also there. Our half-written papers on Long Island and Karkar were obvious choices for such a

volume. A few weeks later Rob and his colleague Elias Ravian were on observation duty on the rim of the inner caldera of Karkar, which had been showing signs of increasing activity. After a survey flight with Rob looking at various volcanic islands in the area, Russell travelled with him to the observation camp and spent a few days there. Then, about a week after Russell left, on the night of 7-8 March 1979, Rob and Elias died when a sudden and violent eruption from the cone devastated the area where they were camped. The proposed volume of papers was edited by Wally Johnson, then at Geoscience Australia, and was called the Cooke Ravian Volume in commemoration. Wally describes this, and much more, in his book "Fire Mountains of the Islands" (see Further Reading).

**Low Island with Prehistorians**

In June 1978 I was invited by Wal Ambrose, (he of the Walrus Club at Kuk), to join some prehistorians on Lou Island, a small volcanic island east of the much larger and non-volcanic Manus Island (much later to achieve notoriety as one of Australia's much vaunted off-shore immigration processing centres). I arrived at Lorengau from Moresby via Madang at 9:30 pm and stayed the night with a teacher from the local high school. I met up with Mark Tilzey, also bound for Lou Island, the following morning and we found the boat that was to take us to Lou. We raced off to get our gear, but when we returned to the wharf the boat had gone. So we took a car and caught the boat at Lombrum Passage, a narrow waterway through the eastern end of Manus. We arrived at Lou at 2:30 pm where we were greeted by Wal and his colleague Jean Kennedy and installed in a house in Rei village, our base for the next 5 days. I spent time doing my usual thing of mapping and characterising the volcanic ashes, some of which covered human occupation sites. The best exposures were along the coast so we spent some time on a local canoe travelling around the island. We also visited the small island of Tuluman, just south of Lou. Tuluman was last active in the 1950s.

Lou is quite small – 11 by 5 km – so it was a bit of a surprise to learn from Wal that in the past there had been fierce fighting between different groups on the island. The island is a prolific source of obsidian, a volcanic glass that breaks to form very sharp edges ideal for making tools, and there are many old workshop areas covered with obsidian flakes and the cores remaining after all useful materials have been struck. The obsidian beds are exposed down the sides of valleys but during fighting they were often not accessible; among other things obsidian flakes were buried in mud tracks as sort of prehistoric land mines to foil bare-footed warriors. Displaying a keen sense of stratigraphy local villagers, confined to a ridge top, dug through the overlying volcanic ash to get to the obsidian layers. The resulting shafts are still there. They are just wide enough to allow one person to descend, sometimes as much as 15 m. Hand and foot holes are dug into the sides. Wal went down one of them to sample the obsidian in its original position, something you couldn't have persuaded me to do. Obsidian from different sources has distinctive chemistry, and Wal has been able to identify artefacts as far away as the New Hebrides as having come from Lou, a distance of 2,700 km.

I mentioned earlier megapod nesting mounds on Bagaman Island in Milne Bay. There are megapods on Lou as well, but instead of building mounds of organic matter to keep their eggs warm they take advantage of sand warmed by volcanic activity to do the job for them. Another evolutionary oddity.

After 5 days it was time to return to the hustle and bustle of Port Moresby. My trip back to Manus was in a *mon*, a canoe about 7 m long and less than 1 m wide carved out of a single tree trunk. It had a round section and no outrigger, and there seemed no good reason why it didn't just tip over. It was powered by an outboard motor. However, we had used one for getting around the island so I was confident – sort of. I carefully packed all my stuff, cameras and notes into my rucksack, which I hoped was waterproof, and off we went, with me keeping a good eye on my gear. However, the sea was not flat (it never is!) and the *mon* rolled alarmingly. After about 20

minutes I gave up worrying about my stuff and just hung on for grim death – another occasion when my life flashed before my eyes. About 4 hours later and much to my surprise we arrived safely back on Manus, to the credit of the crew.

I was able to write a paper on the volcanic ash layers and eruptive history of Lou Island in time for it to be included in the Cooke-Ravian volume.

*The* mon *that took me back to Manus.*

**West New Britain and More Volcanic Ash**

At the end of 1981 Jim Specht, who worked for the Australian Museum, invited me to visit some of his sites in West New Britain Province. As with many other prehistoric sites in PNG volcanic ash was present, and he wanted me to assess an area in the middle of New Britain Island from this point of view. So on 6 December I arrived in Hoskins and set about finding a flight to Kandrian, on the south side of the island, from where I would set off for Yambon.

There was a flight the following day. Jim met me at Kandrian and we set off. I see on Google Earth there are roads through the area now, but in 1981 there was no such luxury. We had to walk. The first night was spent at Awat village, seven and a half hours walk from Kandrian, with only one doubtful bridge that consisted of two or three bamboo poles and a thin liana hand rail. The next day a 7 hour walk took us to Yambon, our base for the week. It was a strenuous day, the best part being a wash in a stream near Yambon that was nippy in two senses, cold, and lots of freshwater shrimps that bit us all over.

Jim had to leave me there after a couple of days because he had commitments elsewhere. Over the next few days I looked at the excavation sites with an eye to identifying any volcanic ash. I also spent some time looking at soils in the local gardens – there was some concern about the capability of the land to support a growing population. The locals get birds from the forest using blowpipes up to 3 m long with a 1 cm hole. My notebook tells me that it was a very isolated area in 1981, and more than 35 km from Kandrian. But now there are roads, and an airstrip at Yambon, although the latter looks on Google Earth as if it is not used.

On the way back to Kandrian I measured several volcanic ash sections to allow me to report more about layering and distribution. My guides weren't in any hurry. We were given some coconuts at one village, and the guides insisted that we eat them before arriving at the next village so they would also give us some. There were a few exposures along walking tracks, and a very good one in Awat village – the local rubbish pit. The only problem was it was thick with sand-flies that drove me nuts. I hired a small boy to keep them off me with a leafy branch. I stayed at Awat for the night, and noted that it was a nice little place with people, pigs, dogs, chickens, swifts, flying foxes and fireflies. Also the usual "6 o'clock crickets" that are quite deafening for about 20 minutes around dusk. My notes tell me that I spent some time introducing the men of Awat to the mysteries of Lipton tea bags.

*The walking track to Yambon.*

The next day I walked on to a Seventh-Day Adventist mission where I stayed the night. On the way I made a stop to measure volcanic ash in a brand new, unused, toilet pit. Very opportune even if it was filled with yet more sand-flies. After dinner there was the inevitable and to me rather useless discussion on creation versus evolution. I got back to Kandrian the next day and organised to stay with the OIC. The following day I sat at the airstrip, having been assured that a plane would arrive and take me back to Hoskins. A plane did arrive, but it was full. However, the pilot promised to return, which indeed he did, so I ended up back at Hoskins that evening. I spent 2 days there doing a reconnaissance of volcanic ash sites and discussing soil patterns and agriculture with an agricultural officer from Moresby who was looking at possible development programs in the Province. On my final night I had dinner with a party of ESSO geologists who were walking in to their exploration camp with a head-office visitor the following day. It was pouring with rain and, as I said in my notebook, “Good luck to them”.

The reconnaissance of volcanic ash sites provided the incentive for what turned out to be my final research trip to PNG, and who better to do it with but my old mate Russell. We had persuaded the Australian Research Council to give us some funds and on 11 April 1985 we were in Hoskins, after a brief look around Rabaul and the Vulcanological Observatory with Chris McKee. The ESSO guys were there again. We spent the next 10 days traveling along all available roads measuring and mapping volcanic ashes from road cuttings and river banks. Bridges were up to their usual PNG standards. We stayed at the Walindi Plantation Resort while we were working on the Talasea Peninsula. They cater mainly for diving groups, and they loaned us a boat and crew to visit some of the very small islands just off shore – we could see that they were covered in volcanic ash. There were no landing places so our usual approach was to swim from the boat to the island.

We also visited Lake Dakatau at the northern end of the peninsula. Like Lake Wisdom on Long Island, Lake Dakatau is a caldera with a complicated history of major eruptions and caldera collapse. The lake is at about 35 m above sea level, and we climbed over the forest-covered rim at about 300 m. On the way up our guides caught sight of a tree kangaroo, and promptly cut down the tree on which it was perched so they could catch it. The tree kangaroo jumped onto another tree, which they also cut down, with their prey escaping into yet another tree. They then changed tactics and proceeded to cut down all the surrounding trees leaving the poor beast stuck up a now isolated tree with nowhere to go. This last tree was cut down, and they pounced, proclaiming that it would make a good feast. They must have laid waste to 400 – 500 square metres of forest. Still it would have saved some work when it came to planting a garden there later.

It all made a consistent story that we published a year or two later with Jim Specht, among others. The eruptions that produced the volcanic ash must have devastated the surrounding countryside, but

this hasn’t stopped people occupying the area, mainly because volcanic ash soils are so fertile.

*A bridge near Hoskins, not quite up to the highlands standard but getting there.*

## Chapter 6. Some Final Thoughts

PNG continues to occupy some of my time. A few years ago when I was still at Geoscience Australia I was called on for advice when a proposed mine threatened the Kokoda Trail. A visit to the area was set up and I even got a visa granted, but ill health prevented me taking advantage of it. More recently researchers from ANU were working on thin volcanic ash units in the highlands and I was able to provide information on places and thicknesses of some of them – I even ended up on the authorship list of a couple of papers. As I said in a recent email to Russell Blong "Had I known you were going to ask me about it 45 years later I would have taken more notice." And I've also been asked to provide memories of my work in the Kokoda valley and Myola Lakes to people who are now working in those areas.

I had a wonderful time in PNG – working there was enjoyable, and at times exiting. All in all it was fun, and scientifically rewarding. I got a PhD out of it, and a number of papers in scientific journals. At one stage in the 1970s I was the only geomorphologist living in PNG, although there were a number of visiting geomorphologists who had much to share with me. Of course I was there at the right time, before and just after independence. There was a real sense that the kind of work I was doing was valuable for development, especially the work on soils and land capability. Also for the most part security was not an issue.

Finally, I thoroughly recommend PNG as a place to visit. There is much to do and see, and many great walks, including the Kokoda Trail, which has become a rite-of-passage for many keen Australians. My only word of caution is that you do some checking before you go – the preceding chapters describe a time long since passed and things are rather different now.

## Further Reading

Here are a few books you might like to read. Many of them are old, so may are not be available in bookshops or as eBooks. I have given links to free downloads where they are available.

Blong, Russell J. 1982. *The time of darkness: local legends and volcanic reality in Papua New Guinea*. Australian National University Press, Canberra. 257pp. Available at: https://openresearch-repository.anu.edu.au/bitstream/1885/114749/2/b1262830x.pdf

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Sinclair, James. 2016. *Middle Kingdom: A Colonial History of the Highlands of Papua New Guinea*. Crawford House Publishing, Adelaide, 510pp.

Strathern, Andrew. 1971. *The Rope of Moka. Big-men and Ceremonial Exchange in Mount Hagen, New Guinea*, Cambridge University Press, 254pp.

Strathern, Andrew and Strathern, Marylyn, 1971. *Self-Decoration in Mount Hagen*. Backworth.

Ward, R. Gerard and Serjeantson, Susan (Editors), 2002. *And then all the Engines Stopped. Flying in Papua New Guinea*. Pandanus Books, Canberra.

## About the Author

Colin Pain was born in New Zealand, and was raised on a sheep farm near Masterton. This explains why he likes lamb/mutton. After primary school in a one-teacher school at Ihuraua, taught some of the time by his mum, he was sent to boarding school in Wanganui where he learnt enough to gain entry into the Department of Geography at the University of Auckland. His adventures in Papua New Guinea began after graduating with a MA from Auckland. Between 1969 and 1985 he spent upwards of 10 years in PNG, either living there or on research trips.

Following the events described in this book, Colin worked at the University of New South Wales, and at the Bureau of Mineral Resources, now Geoscience Australia, in Canberra. He also worked on consulting jobs in Indonesia and the United Arab Emirates. While in Dubai he learnt to drive on the wrong (right) side of the road, a useful lesson that prepared him for retirement in a small Andalusian village in Spain. He currently lives with his wife in Spain, with the occasional lengthy stay in Australia. He occupies himself with editing and writing, and wonders where he found the time to work when he had a job.

Colin Pain was born in New Zealand. His adventures in Papua New Guinea began after graduating with an MA from Auckland. Between 1969 and 1985 he spent upwards of 10 years in PNG, either living there or on research trips. He currently lives in Spain, with the occasional lengthy stay in Australia.

Papua New Guinea is the eastern half of a bird-shaped island north of Australia – the other half is part of Indonesia. It is a wonderful place, and diverse. Parts of the lowlands are the epitome of a tropical paradise, with white beaches and lots of coconut palms. Then there are the mountains, usually close to the coast, covered in rain forest and not so easy to traverse. In the middle are the PNG highlands, large valleys full of people and covered in grasslands and gardens. And around the main islands there are lots of little islands made of coral and volcanoes.

Between 1969 and 1985 Colin Pain spent 10 years off and on in PNG. He was on the staff of the University of PNG, he worked as a consultant for provincial governments, and he carried out research on landforms and soils in many parts of PNG. He climbed anything in sight, and walked long distances through wild country.

This book is a mainly lighthearted memoir of his time in PNG, the research he carried out and his interactions with the people both expatriate and local. It could be regarded as a travelogue, but be warned that it tells of a time long ago, since when things in PNG have changed considerably. For example the Kokoda Trail, a rite-of-passage for many Australians, is very different now from what it was in 1969 when the author took it on. Not that this should deter anyone from visiting PNG. It remains a fascinating country full of wonderful landscapes and people.

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