

1

Towards an Unsanctioned Capital

1.1. The Tolai

The people known as the Tolai live on a large active volcanic complex in the north-eastern part of East New Britain in modern-day Papua New Guinea (Figure 1.1). They are a populous, Austronesian-language group made up of different matrilineal descent lines or *vunatarai*. The Tolai and other Melanesian people such as the non-Austronesian ('Papuan') Baining to the west and the Taulil and Butam in the south have lived in these volcanic surrounds for centuries.

The Tolai themselves are thought to have migrated to the area centuries ago from New Ireland to the east, some through the Duke of York Islands. They settled successfully by taking horticultural advantage of the rich soils of the area's volcanoes and are thought to have displaced the Baining people, who moved into the mountains to the west. The Tolai coastline is long, so providing ready access also to fisheries and other marine resources (Figure 1.2). One well-known name for the Tolai language is Kuanua, a word from the Duke of York Islands meaning 'over there'. Another name, however, is *tinata tuna*, 'our own language'. European linguists, anthropologists, ethnographers, social historians and museum artefact collectors in later times would take considerable research interest in how the Tolai lived and thought (Epstein 1968; Epstein 1969, 1992; Salisbury 1970; Sack 1973; Neumann 1992; Threlfall 2012; Martin 2013).

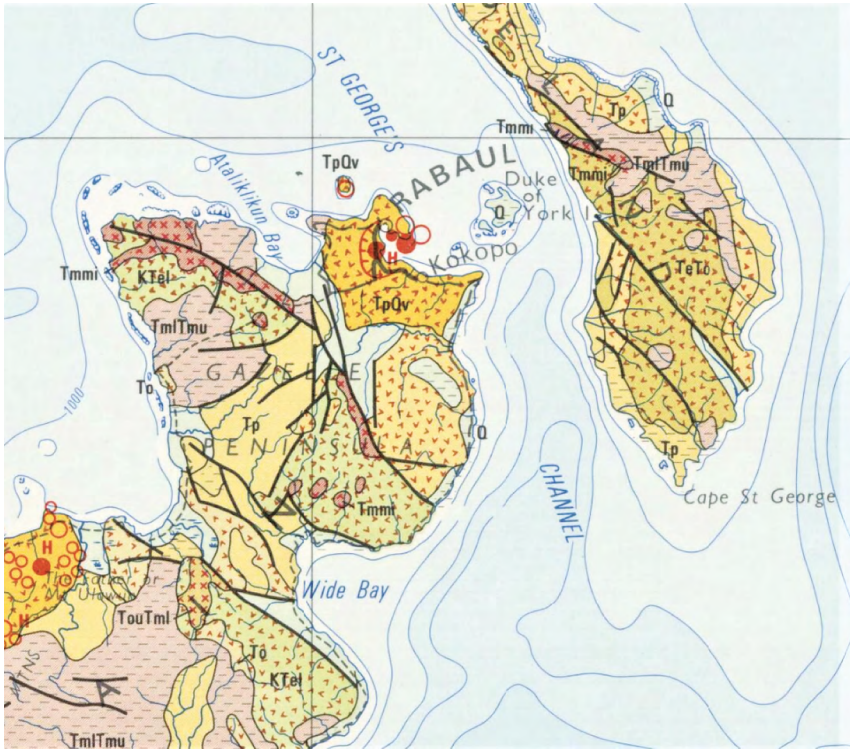


Figure 1.1. Geological map of north-eastern New Britain and southern New Ireland.

The approximate extent of the large active volcanic complex at present-day Rabaul and Kokopo is shown in this detail from a geological map by the orange area (plus v-pattern) and labelled 'TpQv' (after D'Addario, Dow and Swodoba 1975). Most Tolai people live within this same area — that is, mainly north of the Warangoi River (southern boundary) and east of the Kerevat River (western boundary). Latitude 4°S and longitude 152°E are shown by the straight lines intersecting just to the north-east of Watom Island (which is also labelled TpQv). The distance across the area is about 225 kilometres. Ulawun volcano is represented by the filled red circle near the lower left-hand margin.

The whole Tolai area is vulnerable to volcanic eruptions and earthquakes, and its coast to the impact of tsunamis. However, a particularly large eruption in the late seventh century—identified and dated (677–79 CE) by modern geological methods (McKee, Baillie and Reimer 2015)—would have made much of the area uninhabitable, including Watom Island, where Lapita pottery and obsidian artefacts from earlier Austronesian settlement were buried by the eruption's deposits (Green and Anson 1991). Reoccupation of the devastated area, and re-establishment of productive gardens, presumably took place over an extended period as vegetation growth gradually recovered on new soils suitable for gardens.



Figure 1.2. Tolai fishermen working fish trap nets.

Tolai fishermen are seen here working traditional fish traps at the entrance to Blanche Bay (Mennis and Mennis 2019). The volcanoes in the background are Tovanumbatir (in the centre on the distant left) and Turagunan (on the closer right). Watom Island is just visible beneath the cloud to the left of Tovanumbatir. The photograph was taken from the south-east by the late Brian Mennis and reproduced as a postcard by Robert Brown and Associates (Port Moresby).

There appear to have been two main settlements by the 1870s on the shores of what later would be called Blanche Bay: Matupit Island, west of and close to Tavurvur volcano on the eastern side; and Malaguna (Malakuna) on the north-western corner of the bay and referred to as ‘the big place’ by one Tolai elder from Matupit (ToMaran 1951). There were other settlements, too, down the western side of Blanche Bay including Karavia in the south-west where there was a market for the exchange of produce. Life in those days, however, was not peaceful. There was a male warrior culture and fighting between competing clans, perhaps as payback for early misdemeanours. There were inflicted deaths, revenge killings and cannibalism of those who had been killed (ToMaran 1951). And there was sorcery.

The western side of Blanche Bay seems to have been preferred as a place for settlement, rather than the eastern side where visible volcanoes were much closer, although this did not seem to have bothered the Matupits. There are no known Tolai traditions of recent volcanic eruptions taking place on the western side such as would take place in 1878 and then 1937. The north-eastern corner of the bay and adjoining shores were not preferred for settlement because of the presence of swamps and mangroves and, therefore,

likely related debilitating diseases. This place was called Rababaul, meaning ‘the many mangroves’; *ra-baul* is the Tolai name for the mangrove tree. One other favoured settlement area was at Nodup on the coast overlooking St Georges Channel to the east, on the flanks of Kabi volcano, and facing out to the Duke of York Islands.

Numerous features of Blanche Bay—volcanic peaks and ridges, gullies and rocks, prominences and islands, reefs and inlets—have been named individually by the Tolai. Even small, seemingly insignificant locations are named after particular plants, trees and so forth. These physical features are of overall importance because of their intimate association with past events, ancestors and a spirit world that is a part of the Tolai natural environment and belief system. Naming places and incorporating them in genealogies were important aspects of Tolai descent-line claims of landownership. Land still holds special meaning for the Tolai as it does for many other Melanesian groups, reflecting a fluid system of collective land tenure. Early European intruders in search of ‘purchasable’ land who attempted to individuate, codify and regulate land tenure using courts of law appear to have been generally slow to understand the complexities—religious, historical, social and political—lying behind this indigenous view of landownership. Tolai country in effect became a ‘land with two laws’ (Sack 1973).

Volcanic activity was acknowledged by the Tolai both as an agent of landscape creation and change, and as a manifestation of the workings of the spirit world. The word *kaia* in the Kuanua language of the Tolai refers to the different spirits that appear, most commonly, as giant snakes called *valvalir* or *kaliku*. The most prominent *kaia* live inside the craters of volcanoes and may cause volcanic eruptions. Rakaia—‘the Spirit’—was the name given by the Tolai to the volcanic island that was created in Blanche Bay in 1878 even though more than one *kaia* was thought to live there (Neumann 1992, 235–6, quoting in English the German missionaries Josef Meier and August Kleintitschen). Some *kaia* can be befriended and some may be of assistance. One story tells of two Tolai sorcerers instructing two *kaia* who were disguised as snakes and sending them to the volcano at Matupit (Tavurvur)—which was also called Rakaia—to start the 1878 eruption (Meier 1908; an English translation is given by Neumann 1996, 13). The sorcerers also made two magic sticks that were thrown into a fire and any crackling was to be the signal for the *kaia* to use their powers again and stop the eruption. Many earthquakes of volcanic origin are felt in the Rabaul area, and the Kuanua word for earthquake, *gurua*, is now part of the vocabulary of modern Tok Pisin.



Figure 1.3. Tubuan ceremony on Greet Harbour.

Tolai men, including two *tubuan*, participate in a traditional ceremony on Greet Harbour on 29 October 2004. Tavurvur volcano in the right background is inactive, producing only vapour emissions. The photograph was provided courtesy of Shane Nancarrow of Geoscience Australia. The sketch of a *tubuan* on the right is from McCarthy (1963, 221).

Beings in the physical guises of *tubuan* and *dukduk* are created by the Tolai in the form of painted conical, volcano-like heads and bodies of leaves that cover all of the enclosed person's body, except for feet and calves (Figure 1.3). *Tubuan* and *dukduk* heads rise from the leafed bodies as if—to present-day volcanologists in particular—they are volcanic peaks rising from a forested landscape, and the bodies rustle and vibrate during tremor-like shaking movements, as if allegories for volcanoes in eruption and for ground-shaking by earthquakes. *Tubuan* are 'raised' in commitment to the rituals of male secret societies that are also called *tubuan*. The Tolai have complex rites at initiation, mortuary, funeral and other ceremonies that were—and to an extent still are—part of the intricate tapestry of traditional cultural activity in the Blanche Bay area.

Another important aspect of Tolai culture is the accumulation and use of 'shell money' or *tabu*. This refers to the custom of creating a currency by stringing together small *Nassarius* seashells abundantly onto lengths, or 'fathoms', of lawyer cane, to be used in small amounts for trade and exchange, and also, by coiling the lengths into large hoops, for ceremonial displays of wealth (Simet 1991; Kalua 2022). *Tabu* is still used widely today by the Tolai in association with the PNG national currency of kina and toea, as summarised in a very recent article:

This little snail shell is much more than simply a bartering medium. It has traditionally been an intrinsic part of mourning ceremonies, bride price, initiations and other significant customary practices. It is indispensable during sacred rites, particularly so during Kinavai, a ritual which pays tribute to the origins of shell money and the oceanic lineage of the clan. Its exchange forges bonds, resolves

disputes and honours ancestors. It is not just a symbol of prestige but the representation of a profound spiritual belief and its use signifies deep respect within Tolai society. It also plays a crucial role in inter-clan networking and the reinforcement of traditional governance. (Kalua 2022, 37)

1.2. Enlightenment Years in the Pacific

European voyagers of the Enlightenment encountered the Tolai coastline for themselves in the late eighteenth century. The foreign seafarers and their sponsors from Europe were driven by a curiosity for the new lands and people of the vast Pacific Ocean that had been encountered earlier, in particular by the Spanish and was thus called the ‘Spanish Lake’ (Spate 1979). The French and British, however, were the two nations who jostled for ascendancy in the south-west Pacific during the Enlightenment’s ‘long eighteenth century’—that is, a time span including decades immediately before and after the eighteenth century proper, and more precisely defined as 1660–1832 CE using key events from just British history (Sloan 2003). Both France and Britain were driven to find new lands and navigable waters, make scientific discoveries, discover resources and generate new maps (Suarez 2004). They also gave considerable thought to the possible economic and political gains that might be made through European colonisation of these distant but potentially resource-rich lands. Germany, however, exerted a strong influence in the islands of the south-west Pacific as the nineteenth century progressed, including when the Tolai came under pressure to change their traditional ways of life and adapt to a different world.

Captain Philip Carteret in 1767 was on a British circumnavigation of the world when he discovered what he called St Georges Channel and became the first known Enlightenment voyager to get close to Tolai country and to see volcanic activity from within it (Carteret [1767] 1965; see also Hawkesworth 1773). The English explorer and former buccaneer William Dampier, 67 years earlier, had used this name of the English patron saint for a stretch of water that he mistakenly identified as a bay, and indeed had called it St Georges Bay, but Carteret demonstrated that this body of water was, in fact, an important navigable waterway separating Nova Britannia or New Britain (named by Dampier in 1700) from Nova Hibernia or New Ireland (named by Carteret). Both islands, together with the Admiralty

Islands to the north-west, thus comprised a large archipelago north of the previously named and main island of New Guinea and north-west of Solomon Islands. Carteret also identified a large, flat island in the middle of St Georges Channel to which he gave the name ‘Duke of York’s Island’, later to be called the Duke of York Islands, or just ‘the Duke of Yorks’, when smaller islands adjacent the main one were included in the name for convenience.

Philip Carteret was also the first European traveller to identify and name volcanoes on the western shore of the channel, chronicling the following for Thursday 10 September 1767:

[O]n the main or New Britain side are some very high land and 3 remarkable hills close to one and other which We named the Mother and daughters, the mother is the middlemost and biggest, behind these we saw great smoke and imagined it most [sic] have been from a Vulcano. (Carteret [1767] 1965, 342; see also the edited version given by Hawkesworth 1773, 376).

An exaggerated sketch of the volcanic view was made from a point about 28 kilometres to the north-east (Figure 1.4). Carteret was evidently unaware of the large bay that existed behind the three volcanoes and of the smaller, active volcanoes found on its eastern side.

The Mother and two Daughters, bearing S.W. distant 5 leagues.



Figure 1.4. Philip Carteret sketch of Rabaul volcanoes in 1767.

The volcanoes of the Rabaul area are shown highly exaggerated, and even overhanging, in this sketch made from the north-east by an unknown artist on Philip Carteret's voyage to the area in 1767. The sketch is part of an engraved nautical chart entitled *Nova Hibernia* that was published on 1 November 1772. This chart also appeared in the first published record of the Carteret voyage (Hawkesworth 1773) but not in a more definitive, two-volume version edited by Wallis (1965). The ‘great smoke’ reported by Carteret may be represented by the small, lighter-coloured area—indicated by the arrow—which rises slightly higher than the summit of the Mother. If so, the volcano in eruption is most likely to have been Rabalanakaia, lying on the south-western side of the Mother. Tavurvur volcano sits behind the Mother on this bearing and therefore does not appear in the profile.

The French voyager Louis-Antoine de Bougainville was also on a circumnavigation of the globe when, in 1768, he came to the southern end of New Ireland, having followed the north-eastern coast of the large Solomons island that was named after him (Dunmore 2005). He gave the name Port Praslin to his anchorage on the southern tip of New Ireland, an anchorage that would become a place of French tragedy more than a hundred years later. Bougainville was evidently unaware of Carteret's discovery of St Georges Channel the year before and continued his journey north-westwards along the east coast of New Ireland rather than through the strait. Neither did he record any volcano sightings.

Captain James Cook raised the Union Jack on the east coast of Australia in 1770, leading eventually to the beginning of British settlement on the continent in 1788. This was when the First Fleet, under the leadership of Captain Arthur Phillip, and Second Captain John Hunter, arrived at what is now known as Sydney Harbour. A French expedition under the leadership of La Pérouse visited the settlement shortly after this first arrival, but then sailed north into Melanesia where they vanished.

John Hunter was obliged to return to England in 1791 and travelled on a Dutch transport, northwards and through St Georges Channel, stopping off at Duke of York Island where the vessel took on fresh water. He noted:

The hills mentioned by Captain Carteret, on the coast of New Britain, by the name of the Mother and Daughters, are very remarkable. A little way within the south-eastern Daughter there is a small flat-top'd hill, or volcano, which all the time we were in sight of it, emitted vast columns of black smoke. On this coast there appeared many extensive spots of cleared and apparently cultivated land. (Hunter [1793] 1968, 155; see Figure 1.5).

The interaction of the ship's crew with the local islanders was not peaceful. It ended with the islanders submitting to the authority of the guns and cannon fired by the crew. Some islanders were probably killed by grapeshot.



Figure 1.5. John Hunter sketch of Rabaul volcanoes in 1791.

The Mother volcano dominates the central background in this idealised and disproportional view (Hunter [1793] 1968, Plate 11). Its caption is simply 'Canoe of the Duke of York's Island'. North Daughter is shown to the right of the Mother, and a volcanic plume can be seen drifting from the 'flat-top'd hill' to the right of South Daughter. The steep background escarpment to the left of South Daughter in the top-left corner is the large bay—still unnamed by the Europeans—whose northern and eastern margins are rimmed by the four volcanoes shown here. The small island left of centre may represent one of the Credner Islands.

Whether later voyagers of the Enlightenment identified the active volcano and even entered the bay, shown in the top-left corner of Figure 1.5, is unknown. Presumably many of them, like Captain Hunter, would have seen the bay's entrance. Two French voyagers are known to have transited St Georges Channel—Bruni D'Entrecasteaux and Louis Duperrey—although neither recorded anything significant volcanologically. D'Entrecasteaux came through the strait in 1792 on one of his two voyages in New Guinea waters searching for, but not discovering the whereabouts of, the lost vessels of the La Pérouse expedition (Rossel 1808; D'Entrecasteaux 2001). Louis Duperrey, known for his explorations and mapping of the Pacific Ocean (Suarez 2004), sailed through the channel on *La Coquille* in 1823 after visiting Port Praslin on the southern end of New Ireland (Figure 1.6). The naturalist on board, René Lesson, recorded the animosity of the local people to their enemies in New Britain—probably the Tolai—on the western side of St Georges Channel:

[H]atreds are never more alive and more fierce than when they occur between two tribes descended from the same family; and yet the hatred which divides them is so great that the name of Birare (native name for Dampier's New Britain) [see Figure 1.6] pronounced in front of a native of Port Praslin, is sufficient to provoke a terrible anger and to make him utter imprecations in his own tongue which, to judge from the violence of the accompanying actions, must be terribly vigorous and drastic. (Whittaker 1975, 229, translated from French)

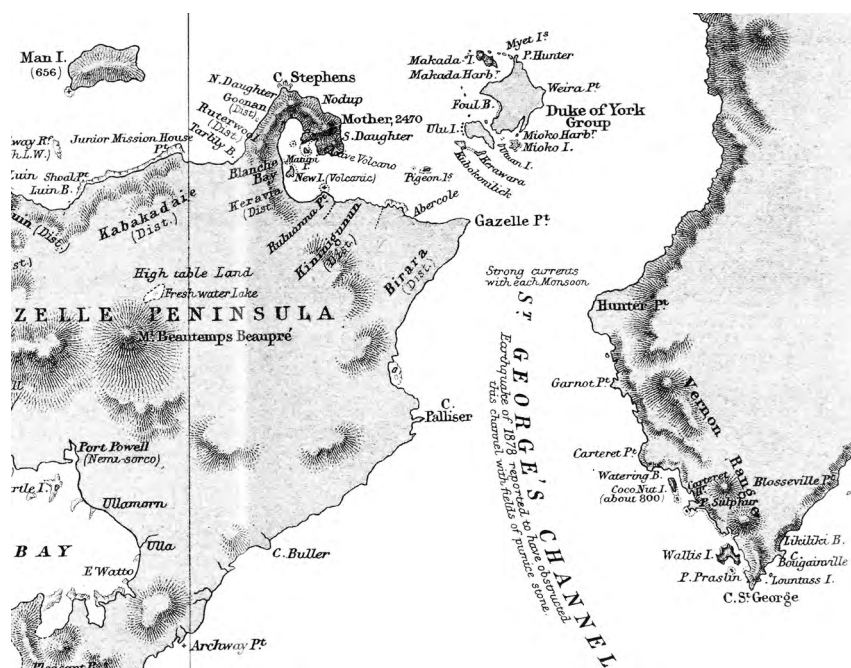


Figure 1.6. Wilfred Powell map of the St Georges Channel area in 1878–79.

Many of the coastal places named by early European voyagers are shown in this detail from a sketch map of the St Georges Channel area published by Wilfred Powell (1883) as a result of his travels in 1878–79. New Ireland is on the right. The distance across the map is about 75 kilometres. Note that Powell has distinguished two districts ('Dist.') on New Britain, including Kiniginuan west of 'Gazelle Point', which in the years ahead would become a centre of European settlement and development. Note also that Powell mistakenly attributes the floating pumice obstructing the channel to an 'Earthquake'.

1.3. Traders, Missionaries and the First Maps of Blanche Bay

St Georges Channel and its nearby coastlines became known even further during the course of the nineteenth century when transiting European voyagers stopped at the Duke of York Islands and elsewhere on the adjacent shorelines for replenishment of water and fuel supplies, thus encountering local people. By the 1870s, the ambitions of European seafarers had changed and many now were more interested in commercial opportunities than they were in Enlightenment-style discoveries.

Mercantile shipping companies were established, particularly by the Germans, and island trading began in commodities such as copra, pearl shell, bêche-de-mer and turtle shell throughout the Western Pacific. Traders were left on islands, where they lived solitary lives dependent on the goodwill of local people who were interested in trading for Western goods and materials such as cloth, tobacco and, later, firearms. Mostly itinerant, these lone traders were also, and necessarily, dependent on the not-always frequent arrivals of company ships. Whalers and the warships of European navies, notably those of Britain and Germany, also prowled New Guinea waters during the mid-nineteenth century.

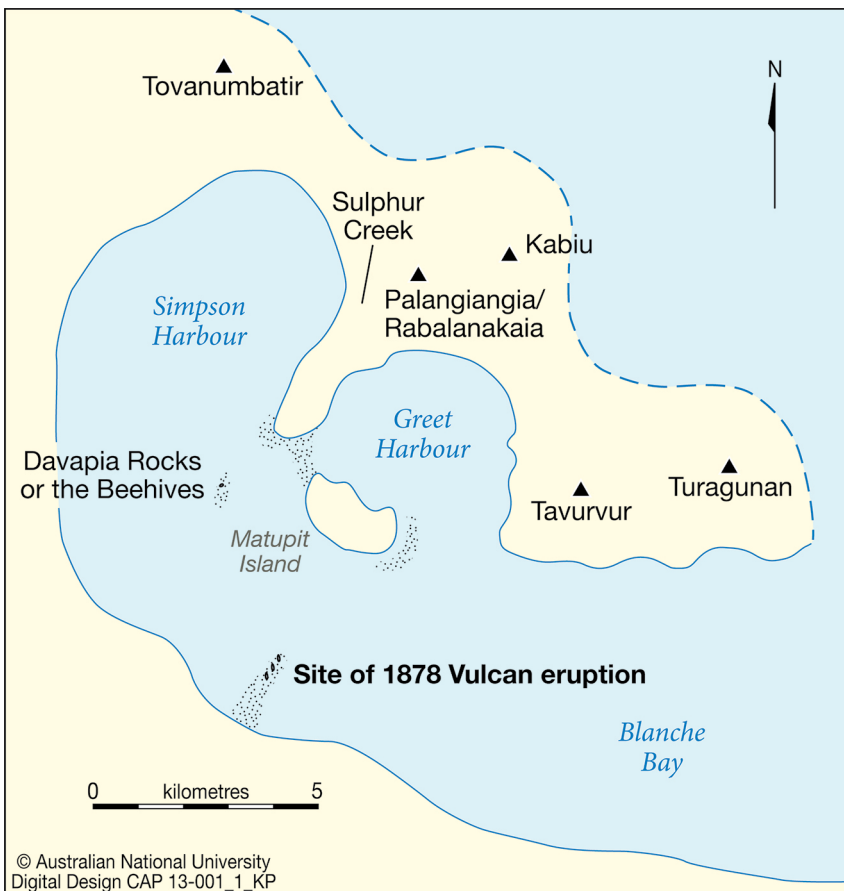


Figure 1.7. Sketch map of Simpson and Greet harbours in 1872.

This illustration has been adapted from the sketch map made by Simpson and Greet in 1872, which was referred to as 'annexed plan 4' by Simpson (1873). The triangles represent mapped peaks, but the names shown are those used today. Sulphur Creek was not identified by Simpson and Greet, and Matupit Island was called Henderson Island.

The British naval surveyors Captain C.H. Simpson and Lieutenant W.F.A. Greet came to St Georges Channel and then entered the large bay west of the Mother on 17 July 1872, naming it after their vessel, HMS *Blanche*. They produced the first map of Blanche Bay, naming waters in the north of the bay after themselves: Simpson Harbour and Greet Harbour (Figure 1.7). Their map is somewhat sketchy and distorted, but it does give a first impression of the imposing scale of Blanche Bay and the prominence of the peaks of North Daughter, Mother and South Daughter. The beauty of the bay impressed them, but Simpson wrote, more pragmatically, that:

[O]ne cannot look at it a moment without being struck at the natural strength of the position in a military point of view ... [there is] water in it for the navies of the world to anchor in, perfectly sheltered from all winds. (Simpson 1873, 4–5)

Simpson and Greet were aware of the volcanic origins of the three main peaks at Rabaul and they identified two further volcanoes—one just west of the Mother, the other west of South Daughter. The Tolai call the former Palangianga and the latter is Tavurvur, which, wrote Simpson, ‘has been much more lately active ... [and] shows evident signs of recent fire, and the whole air in its neighbourhood was still impregnated with the smell of sulphur’ (Simpson 1873, 4). Simpson and Greet were impressed also by two precipitous rocks rising from Simpson Harbour west of Matupit Island. They named them the Beehives, although today they are known also as Dawapia Rocks. Simpson and Greet were surprised to find on the larger Beehive ‘a village containing perhaps 200 inhabitants ... many of their houses are built in the water on piles, they had numerous canoes moored around them’ (Simpson 1873, 5). However, perhaps their most significant observation, bearing in mind the volcanic eruption that would follow in 1878, was the presence of ‘a reef of rocks ending in three or four detached islands’ extending from the south-western shore of the bay. This reef was not obviously a volcano, but its submarine foundation likely had been formed by volcanic activity. A new volcanic island would form there within six years.

The second half of 1875 is notable for three more foreign arrivals to the land of the Tolai: Captain Georg von Schleinitz in command of a German warship, SMS *Gazelle*; a German maritime merchant and entrepreneur, Eduard Hensheim; and a Methodist missionary, Rev. George Brown. Each left their mark on the developmental history of the St Georges Channel area. Schleinitz entered Blanche Bay, surveying and describing its volcanic and marine nature (Schleinitz 1876, 1889). He produced a more accurate map of the bay’s features, compared with the one prepared by Captain Simpson,

and included bathymetric measurements of the two harbours (Figure 1.8). The elongated reef on the western shore is better defined and is shown running towards the small, young volcano—now known as Tavorvur—on the other side of the bay and just west of South Daughter. The island on the south-western side of Greet-Hafen (Harbour) was named ‘Matupi Henderson’ by Captain Schleinitz (Figure 1.8), thus incorporating the local Tolai name, Matupit, for this now well-known geographic feature.

Eduard Hernsheim first came to Micronesia in 1874, eventually establishing a major German shipping and trading network throughout the wider Western Pacific region (Firth 1978b; Hernsheim 1983; Anderhandt 2012). Hernsheim there came up against competition, particularly from the German company J.C. Godeffroy und Sohn of Hamburg, which had established an economic centre in Samoa as early as 1857 (Firth 1983). Hernsheim then tried his luck to the south, in Melanesia south of the equator, starting in the Admiralty Islands area, but then, in October 1875, visiting St Georges Channel and the Duke of York Islands, where, again, there were Godeffroy traders in place. He noted too that Rev. George Brown (Figure 1.9) had recently established a mission centre at Port Hunter on the northern end of the main Duke of York Island. Hernsheim, assisted by his traders, would remain an influence in the economic development of the area until the 1890s. This initial German trading influence represents the start of a gradual, *de facto* colonisation by the Germans—but through an economic process rather than by military invasion and occupation, yet nevertheless taking advantage, where opportunities arose, of the presence of warships and the advantages of pistol and rifle firepower. Economic development also, presumably, benefited now from the pacifying presence of a Christian mission.

Rev. George Brown, accompanied by a team of Fijian and Samoan missionary teachers, had arrived at Port Hunter on 15 August 1875 at a location strategically placed for missionisation in both north-eastern New Britain to the west and New Ireland to the east. Their aim was to establish centres of missionisation throughout this previously un-Christianised area including the Duke of York Islands (Brown 1877, 1908; Threlfall 1975). Local people offered them land nearby at Kinavanua from where they began exploring the two large islands to the west and east. Brown and others, after just two weeks and travelling on two mission vessels, entered Blanche Bay and anchored off Matupit Island where they established good relations with the islanders. One of the Fijian pastor-teachers, Penijimani Caumea, and his wife were transferred to the island on 17 November, representing the first of the Christian denominations to establish mission work on Matupit. Catholic and Seventh-day Adventist missions would be established later.

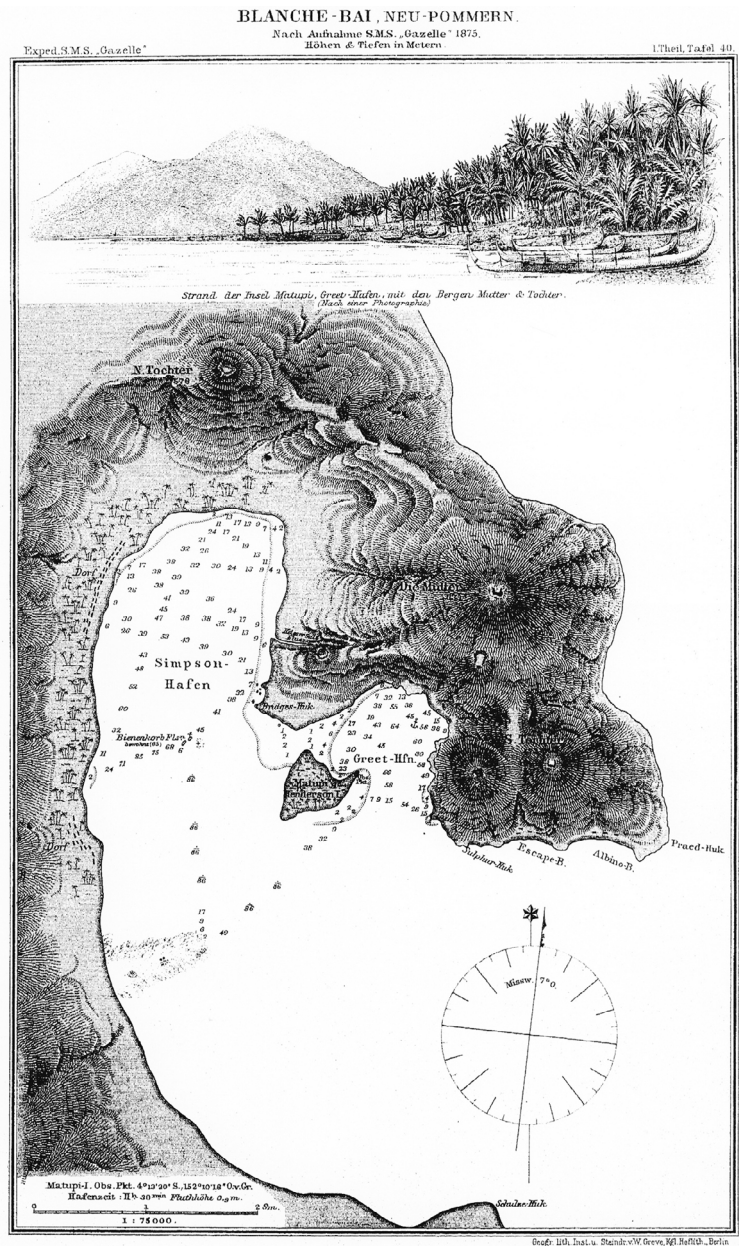


Figure 1.8. Bathymetry of the two named harbours in Blanche Bay mapped in 1875.

This map of Blanche Bay was published by Schleinitz (1889, tafel 4, opposite p. 240) after his surveying of 1875 in the *Gazelle*. The sketch at the top is of Greet Harbour and Matupit Island and was adapted from a photograph. The Mother volcano, Kabiui, is the high peak in the background, and Palangianga/Rabalanakaia is down to its left.

A good deal of interest was paid by many Europeans to the origin and age of Matupit on account of its apparently recent emergence from the sea and the establishment of its well-settled population (Brown 1908; Laufer 1956; Epstein 1969; Mennis 1972; Sack 1987). Soil cover was poor and soil had to be brought onto the island by the settlers to develop sustainable gardens. George Brown reported that:

Matupit was thickly populated and seemed to be a very healthy island. Captain Ferguson [a trader] told me that it was a comparatively recent upheaval, as some of the oldest men remembered a time when no such island existed. This was, I think, confirmed by the size of the cocoanut [sic] trees, as they were all young trees, and appeared to have been planted about the same time. There had recently been a considerable sinking along the shore, amounting to more than six feet in some places, so that it could scarcely be considered to be a very safe dwelling place. (Brown 1908, 93–4)

One interpretation of the name ‘Matupit’ is that it derives from *a mata*, meaning a hole or depression, and from *pit*, meaning ‘stopped short’ (Epstein 1969, 105). A traditional ‘origin’ story is that people crossing the bay would come to the ‘hole’, which teemed with turtle and fish, and be stopped short. This led to European speculation that the hole was, in fact, a volcanic crater and that the island must be of recent volcanic origin. The island in this case would be just like the other young nearby volcanoes in Blanche Bay (Heming 1974). The first settler on the island was said to be a man called Diararat and some Matupit people said they could trace their heritage back to him. Genealogy, therefore, played a part in estimating that the island’s emergence may have taken place as recently as the eighteenth century and been connected in some way to the volcanic eruptions noted by Carteret in 1767 and Hunter in 1791. Volcanic geologists, however, would later argue that Matupit is not a volcano even though it is made up of pumiceous volcanic materials. Nevertheless, the island would play an important part much later in understanding how the young volcanoes of Blanche Bay came into existence.

Later in 1875, Brown climbed the volcano on the other side of Greet Harbour from Matupit Island, west of South Daughter volcano, noting:

The crater was of great depth, with almost perpendicular sides, and was still smoking in many places; but the most recent eruption seemed to have been on the lower land near the beach, where we found the ground quite loose and very hot, with a good deal of sulphur on the surface. The sides of the crater [volcano] were full

of the nests of the megapodes. This bird does not build mounds here, as in other places, but deposits its eggs in the warm, loose ashes of which the hill is formed. (Brown 1908, 129)

Brown here is referring to a quasi-permanent geothermal area on the eastern shores of Greet Harbour and to the megapodes that still nest there today, providing an egg food resource for landowners. Foreshadowing comprehensive geological results obtained a century later, Brown later speculated that:

[M]any years ago the whole of Blanche Bay was itself an active volcano, and I think the soundings which have been recently taken by one of H.I.G.M. ships of war [i.e. SMS *Gazelle*] will probably confirm this opinion. The land on all sides is of pumice formation. My opinion is that the present entrance to Blanche Bay has been formed during some terrible eruption, which burst up the land there, and admitted the sea into the crater, and that this now forms the bay itself. (Brown 1908, 238)

1.4. Volcanic Eruptions in 1878

There is no single, definitive historical account of the volcanic eruptions in Blanche Bay in 1878. Rather, information has to be assembled, at least in the first place, from fragmentary records left by Europeans, none of whom was in the bay when the first outbreaks took place. A notable compilation, however, was made by the late R.J.S. Cooke for a paper on submarine eruptions in Papua New Guinea (Johnson, Everingham and Cooke 1981). Further, four Europeans who reported on the 1878 eruption, including Rev. Brown, appear to have benefited from verbal information provided by Mr William Hicks, a trader of biracial heritage from Fiji who lived on Matupit Island and who witnessed the start of the eruption.

George Brown was in the Duke of York Islands (Brown 1878, 1903, 1908). He recorded in his diary for 30 January 1878 that he had heard on this day that the volcano ‘at Matupit’ was active but that he could not leave to investigate because of ill health (Brown 1878). Matupit Island itself is not a volcano, so Brown apparently was referring to the volcanic cone on the east side of Greet Harbour—known today as Tavorvur—which is out of view from the Duke of York Islands unless eruption clouds rise above South Daughter volcano. Also, the volcanic unrest that apparently took place on 30 January may not necessarily have been a true explosive eruption

of magma, such as happened later, but rather some sort of preliminary disturbance—perhaps increased vapour emission from the volcano, vent-clearing explosions or even geyser activity in the geothermal area at Greet Harbour. There is also some confusion in that the name Matupit, or Matupi, is given in some reports, including Brown's, to the active volcano itself (Tavurvur) and to Greet Harbour–Matupit Harbour.

An eruption in Blanche Bay was apparently well underway by 5 February, as Brown (1878) recorded in his diary that he saw on that day 'Matupit in full eruption, a thick heavy cloud of smoke hanging over it and hiding the coast for miles'. He had not mentioned the eruption in entries for the two previous days, but over the next 11 days he was able to collect further information. Frequent and locally strong earthquakes had preceded the eruption (Brown, diary entry, 16 February). The earthquakes were particularly violent in Blanche Bay overnight on Sunday 3 February, although they were not felt by Brown in the Duke of York Islands. The next morning, 4 February, two tsunamis eroded shorelines in the bay, and soon afterwards 'clouds of steam were observed rising from the Bay in a direct line' between Tavurvur and the south-west shore of the Blanche Bay. A submarine volcano developed into an island about 1.5 kilometres from the shore at the south-western end of this line where previously there had been only the reef and islets mapped by Simpson and then Schleinitz. The other vapour clouds disappeared and then Tavurvur 'burst out with terrific power' a few hours later. People on Matupit Island fled to safer parts of the bay's shoreline, probably mainly to the north-west, so avoiding any ash fallout from Tavurvur. February is in the monsoon or 'north-west' season when winds blow mainly to the south-east.

The explosive eruptions from both eruption centres in Blanche Bay were also described by Wilfred Powell in his spectacularly titled *Wanderings in a Wild Country: Or Three Years amongst the Cannibals of New Britain* (Powell 1883). Powell was an adventurous Englishman, one of the 'landed gentry' back in Britain, and perhaps best described as a 'gentleman-explorer'. His uncle was the father of Lord Baden Powell, founder of the Boy Scout movement. Powell spent a good deal of time in 1878–79 exploring New Britain in the ketch *Star of the East* (see Figure 1.6). He was imprecise about the times of the volcanic events at Rabaul in 1878, including making the error that the eruption was in May. He reported that he had been unaware of the eruption until 'huge blocks' of floating 'pumice stone' surrounded his ketch anchored at Makada in the Duke of York Islands, but that he could see 'smoke and fire' plainly. The next day he set out to visit Blanche Bay but found he had to sail 'a long way round to the northward, to avoid the enormous fields of

pumice-stone that had drifted down the channel’ (Powell 1883, 112). The pumice had been blown out of Blanche Bay by the north-west winds, thus interfering with the movements of ships, whaleboats and canoes. Powell also produced a dramatic description of Tavurvur’s activity that he saw upwind having climbed to the summit of the Mother:

From our situation we could gaze down into the fiery crater beneath. In the evening the sight became more than grand—it was awful; every few moments there would come a huge convulsion, and then the very bowels of the earth seemed to be vomited from the crater into the air; enormous stones, red hot, the size of an ordinary house, would be thrown up, almost out of sight, when they would burst like a rocket, and fall hissing into the sea. At the same time angry flames would dart up, almost to the altitude on which we stood, and of the most dazzling brightness. Then all would die down to a low, sulphureous breathing, spreading a blue flame all over the mouth of the crater, whilst over us and all the country near hung a panoply of thick black smoke, broken only by the falling of red-hot stones in showers, which destroyed all the vegetation to leeward to a distance of about two miles. (Powell 1883, 113)

Eduard Hensheim encountered the floating pumice in St Georges Channel on 9 February on his return to his base at Makada in the Duke of York Islands (Hensheim [1878a] 2015, 1878b). He had retired to his cabin for the night after rounding Cape St George on the southern tip of New Ireland, but was woken by a commotion on deck. The engines had been stopped, and the ship’s captain came up to him

in great anxiety and said that we must be on the wrong course, for there was no passage here of any kind—we were heading straight for land. And in fact a low-lying coast appeared to extend far and wide before us. When we drew closer we found that what we had taken for land was drifting lava [sic] through which we could force our way only with great difficulty. (Hensheim 1983, 38)

Hensheim ‘found the entire northeast coast of New Britain shrouded in thick smoke’:

Thick layers of pumice covered the ocean as far as the eye could see ... The passage between the Duke of York Islands and New Britain was closed by a thick blanket of pumice up to 1.5 and 1.8 m thick. (Hensheim 1878b, 372–3, translated from German)

Similarly, Rev. Brown (1878) recorded in his diary on 13 February that: 'The whole channel in front of our house [in the Duke of York Islands] and seemingly for miles to the southward is full of enormous fields of pumice stone from the volcano.'

Another European author of an account of the 1878 eruption was Captain H.W. Wendt, in charge of the vessel *Peter Godeffroy* (Wendt 1879). He arrived in the Duke of Yorks area in mid-year, well after the end of the eruptions at Blanche Bay. He was, therefore, not an eyewitness and had to depend on information provided by an unnamed 'agent' on Matupit Island. Wendt dated the Blanche Bay events one day later than did Brown: a strong earthquake overnight on 4 February and another the next morning. This second earthquake, he wrote, was accompanied by six tsunamis, initially 4 metres high, beginning at 6 am. Wendt also, as well as Brown, referred to a 'line of fire' (Wendt 1879, 179, translated from German) that made its way across the bay from the volcano (Tavurvur) on the mainland south-westwards towards the site of the submarine eruptive centre. The word 'fire' here presumably referred to visible water vapour rather than to flames from any combustible material emerging from the sea. Wendt concluded that the two eruptive centres were probably 'closely linked with one another'.

George Brown and Wilfred Powell made separate visits to the newly formed island in Blanche Bay shortly after the eruption had ceased but while Tavurvur volcano across the bay was continuing its explosive activity. Brown made his visit to the island on Friday 15 February together with Mr Hicks in his whaleboat, leaving from Malaguna (Malakuna) on the north-west side of the bay. Hicks had evacuated there from Matupit Island. Brown had had to avoid floating pumice masses in St Georges Channel on the way to visit a teacher-missionary at Malaguna. He noted on the southward trip from Malaguna past Dawapia Rocks (the 'Beehives') that they 'were gradually sinking as the Houses which were some feet above high water mark on my previous visit are now quite flooded at high water' (diary entry, 16 February). This was in contrast to the new volcanic island further south that Brown said had been 'upheaved' and the former reef 'raised up' several feet; in reality, the new island had been formed mainly by the subaerial accumulation of newly erupted pumice and ash.

The surface of the new island was still hot and care had to be taken while walking on it, especially near a water-filled crater where the water was of scalding temperature. The heat, however, had not prevented Mr Hicks on an earlier visit from planting coconuts on part of the new island, thus

claiming possession of the land. Who actually owned the new land would be a recurrent topic of future discussion and dispute. The hot waters in the bay also had killed and cooked fish and turtles, the valuable but now damaged shells of the turtles falling off easily as a result. Powell noted that the island was semicircular in form and gave its dimensions as about 2 miles in extent and 70 feet high, noting also that a short spur on the north-eastern side was terminated by 'a small island covered with bushes' (Powell 1883, 113)—that is, the remains of the reef and islets mapped by Schleinitz and Simpson. Brown gave the name 'Hicks Island' to the recently formed land (Brown 1903, 466).

George Brown also described the ongoing eruptive activity at 'the old crater' on the other side of the bay towards Matupit Island:

[I]t presented a grand and awful sight; billow after billow of thick black smoke and flame were shot out with great force, and formed a very high column, which towered up far above the surrounding mountains [including the Mother] ... For a few minutes there would be a comparative lull, then a deep rumbling sound, after which there was a loud roar, followed or accompanied by violent expulsions of ashes and pumice, and cloud after cloud of thick smoke following each other in quick succession ...

Not a green leaf was to be seen, though all was covered with grass and trees a fortnight before. The dead and blackened trees, with almost every branch beaten off by the stones, stood like spectres on the hillsides and gave a most mournful aspect to the scene, whilst the cocoanut [sic] trees on Matupit and places far enough away to escape destruction, were so weighted by the dust and ashes that their leaves hung straight down by their stems, giving them a rather comical appearance—in fact we all agreed that they were very much like a lot of closed gigantic Chinese umbrellas ...

As we passed down the bay on our way home [to Malaguna] we found that another point of land had been formed near Escape Bay, which was about twenty feet in height and extended seawards about 150 yards from the old shoreline. The whole of the vegetation from Point Praed [north-westwards] to the volcano was entirely destroyed, the prevailing wind having carried the pumice in that direction ... the banana plantations and cocoanuts [sic], on which the natives depended for food, not showing a sign of life. We heard that one woman who was unable to get away was killed by the first showers of stones. (Brown 1908, 243–5)



Figure 1.9. Portrait photograph of George Brown in later life.

This portrait of Rev. George Brown DD is from the frontispiece to his autobiography (1908). The photographer and the precise date of the photograph are unknown.

The date of the last eruption from the 'old crater' is unknown. Wendt (1879) was told that the volcano continued to be active for another three weeks after the formation of the new island to the south-west, and Powell (1883, 114) wrote that the eruption lasted 'upwards of a month'. Brown (1878) recorded that the eruption was still in progress on 24 February, and he visited the volcano after the activity had ceased, noting that a new crater had been formed. A duration of three to four weeks is in contrast to the much shorter duration of perhaps three to four days for the submarine, island-forming eruption that, notably, had begun its activity a few hours before that of the volcano on Matupit Harbour. The two volcanoes, therefore, were in simultaneous 'double eruption' for only a few days.

The effects of the floating pumice drifts on the open sea were apparently experienced long after the two Blanche Bay eruptions had ceased their activity, and not only in St Georges Strait. Guppy (1887) wrote that the pumice was carried eastwards by the ocean currents, deluging the shores of the Solomon Islands, impeding navigation and temporarily suspending the *bêche-de-mer* industry. Large quantities of pumice were washed up on the islands of the Ellice Group. Captain Harrington sailed through the pumice for four days and noted that the bottom of his ship was 'scraped clean of paint' by the abrasive rock (Harrington 1878, 373–4).

The changing seasons and wave erosion over the following years impacted on the shape of the new island and shorelines produced by the eruptions in Blanche Bay, at least until vegetation was established and the bare land surfaces became more stabilised. George Brown referred to a visit he made to the island in August 1897, noting that it was

much reduced in size and height, and is now only about two miles in circumference, and about 30 or 40 feet high. The crater continued to emit boiling water for at least two years after the eruption, and the lagoon still exists; the pumice has consolidated, part of the shoreline has been washed away, and some of the material has been deposited in what was formerly a channel between the new island and a small rocky islet, but which channel is now quite filled up. The whole island is covered with vegetation, and there are casuarina trees on it at least 30 feet in height. (Brown 1903, 468)

The island was also mapped later by the Germans, receiving from them the name Vulkan Island, after the Roman God of Fire (see Figure 1.13). The Tolai, on the other hand, used the names Rakaia, Baluan and Kalamaganun. The ‘old crater’ on Greet or Matupit Harbour became known by the Tolai name of ‘Tavurvur’—meaning, appropriately, ‘the hornet’s nest’.

In conclusion, only an approximate account can be given of the 1878 eruption using what are incomplete European sources. The compilation is sufficient, however, for comparisons to be made with the ‘double’ eruption that took place in 1937, and it can be supplemented further by a valuable and nearly forgotten account of the 1878 eruption dictated by a Tolai eyewitness. The account was published in 1951, more than 70 years after the eruption, in the *Pacific Islands Monthly* magazine, and was said to have been told more than 30 years earlier—that is, about 40 years after the 1878 eruption itself. The eyewitness was an old Matupit man called ToMaran, who told his story in ‘pidgin’ English, or Tok Pisin, which was then translated, transcribed and edited into English—a series of steps that may have resulted in some loss of original meaning (ToMaran 1951; see also ToMaran n.d.). Tok Pisin is a creole language that today is one of the official languages of modern Papua New Guinea.

ToMaran recalled that the weeks and months prior to the eruption were ‘a time of famine and hunger’ for the Matupits because the ground on their island had been ‘getting steadily hotter—it was this that had killed our gardens and started the famine’ (ToMaran 1951, 67). Severe tremors then began to be felt ‘so that at times our people were thrown down and none could remain standing’. The Matupits had shell-money wealth and one day a large group of them decided to cross the bay to Karavia to buy much needed food, but on the way ‘with a noise like a great cannon, there burst forth out of the sea not far from us a great explosion which threw the seawater high in the air’. They returned to Matupit, one canoe being caught up in tsunamis from the submarine disturbances. Then, next morning while at Matupit watching the eruption across Blanche Bay:

[S]uddenly a new opening appeared along the beach near the sea, throwing fire high up the mountain side [at Tavurvur]. Stones were shot high into the air, also dense smoke [from which] fell much ash, so that some of the people of Talawat, nearby, were killed. (ToMaran 1951, 67)

The Matupits decided to evacuate to Malaguna, 'the big place' to the north-west:

We embarked in our canoes, and the trader, Bell [or 'Bill', the shortened name of William Hicks], went off to Malaguna, also ... The falling ash had fouled the food in our canoes. None of what we had brought to Malaguna could be eaten, and we suffered hunger again, and for that the people of the big place fought us. Yes, our men stole from their gardens so that trouble arose and they cried out that they would kill and eat us. A mary and a man were killed where Komines [a Japanese boatbuilder] now stands. (ToMaran 1951, 67)

The ToMaran account has two points of disaster significance that were not alluded to by the European chroniclers. The first of these is that 'many' people died as a result of the eruption. A significant number of fatalities might be expected for people exposed to fallout of heavy volcanic debris or to tsunami impact along shores. Brown (1908, 245), however, said he heard that only one woman had died, near Point Praed, 'but I could not find out whether this was true or not'. The second point in the ToMaran account relates to whether the 'drought' on Matupit was caused by the ground on the island becoming volcanically heated before the eruption. Again, there is no confirmatory evidence from other sources, but the claim is of some interest in comparing precursory volcanological events with those in 1937.

Eventually the 1878 eruptions ceased and the Matupits returned to their island. However, the

ownership of the land gave us some trouble to define, for the old boundaries could not be seen. Trees were broken, rocks covered up, and the beach was not the same shape it had been. Many owners had died. (ToMaran 1951, 67)

Village discussions were held and 'the land was re-alloted [sic] and the ownership then decided has held good till this day' (ToMaran 1951, 67). Factional fighting among some Tolai also broke out over landownership of the newly created volcanic island across the bay from Matupit. The fight was between the Tavui-Liu and Valaur people on one hand and the Davuan and Matupit on the other, according to Sack (1987, 12, see footnote), who referred to another Tolai version of the 1878 eruption compiled by Johann To Vairov and published in the German mission magazine *Hiltruper Monatshefte*.

The fierce reactions of a disaffected Tolai leader, Talili, and his supporters were encountered in April 1878 south-west of Blanche Bay when four Fijian missionaries of the Methodist mission were attacked, killed and cannibalised. This led, controversially, to a forceful response by a group of traders, missionaries and friendly villagers, leading to the destruction of gardens and houses in the name of ‘compensation’, and to further killings (Threlfall 1975). Rev. George Brown was not part of the retaliating group and he arranged a peacemaking ceremony afterwards. However, Brown accepted responsibility for the actions of his Fijian missionaries and, in consequence, his reputation became unfairly stained as a man of violence. The Tolai placename Taliligap is a contracted form of ‘Talili shed the blood’. Similar confrontations involving the Tolai would be met head-on by a new settler community that grew in the Blanche Bay area in the colonial decades ahead.

1.5. Eruption at Sulphur Creek in the Mid-Nineteenth Century

The value of Tolai ‘oral history’ has been somewhat controversial, questioned by some in favour of the written European word, but defended strongly by European historians of the Tolai such as Peter Sack (1987) and Klaus Neumann (1992, 1996). The question of how much volcanological and historical truth can be derived from Tolai stories can be addressed with regard to an account that was collected in 1984 and translated from the Kuanua by Lily Waisea in association with Inge de Saint Ours, and then edited and published by Klaus Neumann (1996, 18–19). The account was told by John ToVui, then in his early eighties.

ToVui’s story is of interest because he and his ancestors knew of *six* specific eruptive events from Blanche Bay volcanoes taking place before the two eruptions in 1878. Two were from Tauruvur. A third eruption was from Palangianga (meaning ‘teethy ridge’), also known as Ralilip (meaning ‘the fence’). An eruption from Rabalanakaia, within Palangianga, was next, and the remaining two events were from Sulphur Creek, as follows:

The eruption of Iavtirane or Tokurkurung, which is now known as Sulphur Creek, followed. Its first submarine eruption. Its second eruption took place over 130 years ago [i.e. before about 1854]. It created two craters: Tokurkurung-Tawa, featuring a swamp, near the Rabaul Golf Club [in 1984], and Tokokurung-Maga, a dry crater on the Rabaul Town side of Sulphur Creek. Iavtirane was Sulphur

Creek's first name. It originated during its first major eruption, the people began calling it Tokurkurung as they heard a thunder-like rumbling when it was building its latest craters. (Neumann 1996, 19)

Sulphur Creek volcano is clearly identifiable today as small craters at the head of the straight, canal-like inlet—also known as Matanataka or Matamatar Creek—that runs eastwards from the harbour towards Rabalanakaia. The mid-nineteenth century eruption at Sulphur Creek mentioned by John ToVuia was first recorded much earlier as a metaphoric story of battling spirit-beings from the Rabaul area. An elderly Roman Catholic missionary, Father Georg Boegershausen, in 1937 informed the *Rabaul Times* about meeting elderly villagers who remembered the volcanic activity at Sulphur Creek (Boegershausen 1906, 1937). This was during the priest's first years of living on Matupit Island, from 1900 to 1911. His main source was a prominent village leader, ToMulue, who said in the retelling by the priest:

All that land rose during a heavy earthquake. I was a young man when it happened, and now I am, but for an old woman at Davaun, the only living witness. It was in the morning about 9 o'clock, we were holding a sing-sing, when near Matanatar the earth broke in eruption. The crater is called Kururung maqe—it is close to the hot water creek in Rabaul. A big crab had a quarrel with a snake and caused the eruption. Stones were thrown inland ... A large district of new land rose on the mainland and two-thirds of Matupit from Kikila to the passage. (Boegershausen 1937, 15)

Father Boegershausen estimated that the eruption must have taken place sometime in 1845–50. He also mentioned in his 1906 report that an earthquake had been felt a few months previously in Rabaul, on 1 October 1905. It was 'only a local one', but it might have heralded a volcanic eruption (Boegershausen 1906, 112).

Rev. Brown had noted that:

The old people told us that there was a small eruption, not nearly so large as the present one [1878], some thirty or forty years before [i.e. 1838–48], but since then the volcano has been very quiet indeed. (Brown 1908, 242)

Brown, however, did not state, or perhaps did not realise, that the volcano being considered may have been the one at Sulphur Creek. This is in contrast to two other Matupit islanders who were boys at the time of the eruption and who did recall the event—namely, Tului (Boegershausen 1937) and ToLivai (Cilento 1937a, 1937b).

The precise time, duration and character of the Sulphur Creek eruption, or eruptions, are uncertain from all these accounts. There is also a volcanological question of whether the volcano at the head of Sulphur Creek can be considered as a ‘satellite’ or ‘adventive’ eruptive centre of the nearby and larger Palangianga. Note also that Palangianga volcano is the prime candidate for the source of the eruption cloud seen by Carteret in 1767 (Figure 1.4).

1.6. The Colony of German New Guinea

The years of the late nineteenth century following the 1878 eruptions were eventful, not because of any notable volcanic activity but because of increasingly robust European settlement and the creation of a German New Guinea colony, as recorded by many historians (Sack 1973; Hempenstall 1978; Hahl 1980; Firth 1983; Hershheim 1983; Neumann 1992; Hiery 1995; see also *Südsee-Handbuch* 1920). Land acquisition from Tolai people became a requirement for the settlers, and there was more foreign-company trade and local investment. Shipping became more frequent through St Georges Channel and steamers would stop off at the Duke of York Islands to take on coal that was stockpiled and sold there (Figure 1.10). The Tolai themselves were thrown into a new environment that required adaptation to this Western invasion of colonialism and all of its requirements and demands. Conflicts with the Tolai, attacks and retaliations are part of this history of economic development, but also pacification as Christian missions expanded their proselytisation.

The year 1879 can be said to mark the start of development of a ‘planters’ community in the area. The part-Samoan Emma Forsayth, together with an Australian, Captain T. Farrell, arrived from Samoa, settling first at Mioko in the Duke of York Islands and establishing a new commercial base there (Robson 1965). Emma, or ‘Queen Emma’ as she became known later, brought members of her extended family in Samoa to join her, including her sister Phoebe and Richard Parkinson, Phoebe’s husband. Parkinson in 1882 began surveying the nearby New Britain coastline and chose Ralum on

the Kinigunan, or Kininigunan, coast (Figure 1.10), about halfway between Raluana Point and Cape Gazelle, as a site where plantations might be developed. New headquarters were established at Ralum that later included not only extensive plantations but also a small port and Gunantambu, where an increasingly wealthy Emma later built a luxurious residence.

German commercial interests continued to strengthen in the St Georges Channel area. French colonists were taking more than a passing interest in settlement too. Ships began arriving from France in 1880 carrying colonists who had invested in establishment of Nouvelle France at the southern end of New Ireland. This was where Louis de Bougainville in 1768 had anchored at Port Praslin (Figure 1.6)—named after a French duke, although Bougainville did not necessarily recommend it as a place of settlement. The Marquis de Rays in France thought otherwise, and convinced people requiring a new start in life to invest and travel to the other side of the world. The proposal was a scam and the results were disastrous (e.g. Biskup 1974). There was hardly any land suitable for agriculture, diseases were rife, people died and settlement failed. Survivors were rescued and Emma Forsyth benefited by salvaging the equipment and furnishings intended for New France.

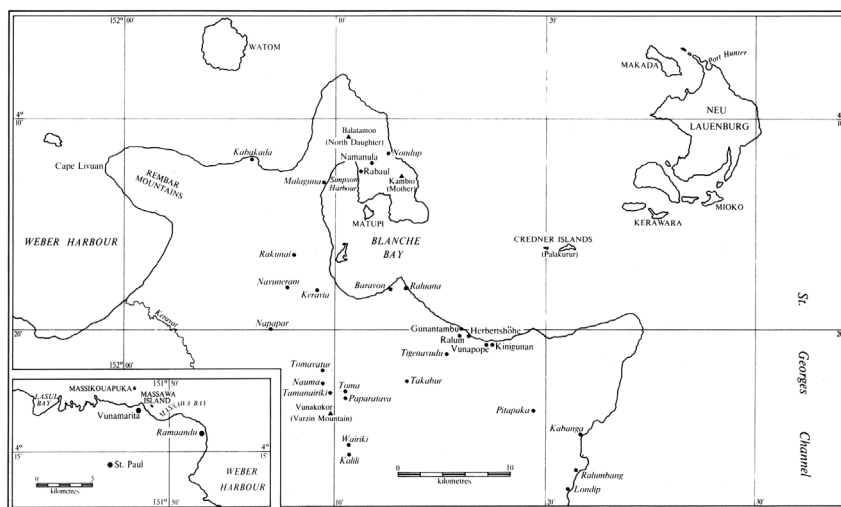


Figure 1.10. Map of the Rabaul region in German times.

The north-eastern Gazelle Peninsula and the Duke of York Islands are seen in this map from German times (Hahl 1980, Map 4).

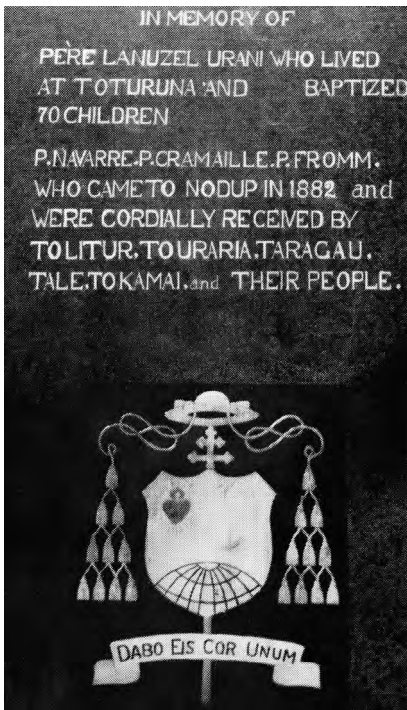


Figure 1.11. Commemorative plaque at Nodup.

Nodup on the St Georges Channel coast plays a special role in the story of volcanic eruptions in the area. It would become a key assembly and departure point for evacuees from the town of Rabaul in 1937. Nodup was also the place where, in 1882, MSC fathers established their first mission station for work among the Tolai. The commemorative plaque shown in this figure was erected at Nodup and the photograph is from a publication celebrating 100 years of the Catholic presence in the Rabaul area (MSC 1982, n.p.).

A French Roman Catholic missionary also came out with the de Rays expedition but, in 1881, after the failure of the Port Breton settlement, he moved for a few months to north-eastern New Britain, visiting Matupit and then Nodup, or Nordup, on the shore of St Georges Channel, before returning to France (Mennis 1972; Threlfall 1975; MSC 1982). Missionary Rev. George Brown also departed from the New Britain area in 1881 owing to ill health, but Methodist missionisation continued unbroken. The Pope in that year, 1881, assigned the vast Vicariate of Melanesia and Micronesia to the Missionaries of the Sacred Heart of Jesus or MSC and, in 1882, three Roman Catholic missionaries arrived, first setting up at Nodup (Figure 1.11) and then, in 1883, at Kinigunan. They even established, in 1884, a mission at Malaguna within Simpson Harbour and then a presence on Matupit Island alongside the Methodists. More significantly, vicariate headquarters were eventually built, in 1889, near Kinigunan and named Vunapope—the ‘place of the Pope’ (or ‘Popies’). From the early 1880s, Catholicism and Methodism were, therefore, very much in competition, no doubt providing some confusion to the unbaptised and non-aligned Tolai (Figure 1.11).

Hernsheim & Co., like other trading companies, was well established throughout the St Georges Channel area, and Eduard Hernsheim by 1883 had built his own home and trading base, including a copra factory, at Raulai on the eastern side of Matupit Island within Blanche Bay. He was evidently untroubled by any memory of the 1878 eruption or by the ongoing volcanic threat from the damaging, previously active volcano, Tavurvur, at his doorstep across Greet Harbour. Hernsheim, rather, clearly was charmed by the beauty—and economic potential—of the bay:

[T]he site looked out over a wonderful panorama of the deep blue waters of Blanche Bay. To the left rose the pointed cones of the ‘Mother’ and ‘South Daughter’ mountains, and alongside them the perpetually smoking crater of the volcano sent up its light sulphurous vapours. To the right the coast line, fringed with coconut palms, stretched as far as the eye could see. In between lay the sea, of every imaginable shade from deepest blue to the green and white of the surf. (Hernsheim 1983, 65)

Evenings in late May 1883 and afterwards were especially impressive:

The evening lights on these mountains, when the green gradually changed to red and then to deep violet and every single tree stood out against the background in the clear air, turned this spot into a scene of the greatest beauty, which I can never forget. These colour effects were particularly magnificent in the year 1883, and I heard later that this was due to the mighty eruption of the volcano of Krakatoa in the Sunda Straits, thousands of miles away, which filled the whole of the atmosphere with its cosmic dust and gave rise to these wonderful colour effects by the refraction of light. (Hernsheim 1983, 81)

Hernsheim here is referring to the catastrophic volcanic eruption of 20 May 1883 when Krakatau volcano in the Dutch East Indies collapsed, producing large explosive eruptions, devastating tsunamis and a large, mainly submarine, caldera (Symons 1888). What Hernsheim would not have recognised was that eruptions of this scale had also taken place in the Blanche Bay area and, indeed, that the magnificent flooded bay itself owed its existence to more than one caldera-formation event in the not-so-distant geological past.



Figure 1.12. Dawapia Rocks in 1883.

Some Tolai people had re-established themselves on this, the larger of the Dawapia Rocks (or Beehives), by the time this photograph was taken in 1883, five years after the 1878 eruption, and the year before Germany declared its protectorate. Source: Methodist Church of Australia, Department of Mission Papers, held by the State Library of New South Wales. Published courtesy of the Uniting World Mission.

There had been growing concern from European settlers in the colonies of Australia—which were all still part of the British Empire—and especially in Queensland, about the increasing German presence in the area to the north-east of Australia. This concern was expressed symbolically in April 1883 when Henry Chester, the Thursday Island magistrate, raised the Union Jack on behalf of Queensland at Port Moresby on the south coast of New Guinea. He claimed all of New Guinea island east of 141°E, together with the islands adjacent to it, as far as 155°E. The British Government did not ratify the claim, however, and in 1884, the Reich made its own claim—after discussions with Britain—on a German protectorate for the north-eastern part of mainland New Guinea and adjacent islands including New Britain and New Ireland.

In the early 1880s, Otto von Bismarck, Germany's 'Iron Chancellor' (Ludwig 1927), was not a strong supporter of German colonisation and imperial administration of distant territories in the Pacific. Other Germans, however, were committed to economically aligned foreign-policy objectives, profits and nationalistic empire building. These included wealthy investors and bankers such as Adolf von Hanseemann in Berlin, as well as representatives of the other trading and shipping companies already operating in the St Georges Channel region. For example, the German naturalist Dr Otto Finsch, exploring the north-eastern coast of New Guinea on board the *Samoa* in early 1884, had encountered the active volcanoes there, but had apparently been more focused on the identification of potential harbours for German settlement and economic development.

Bismarck in 1883–84 was under some domestic political pressures to accede to a program of colonisation in the New Guinea area. Adolf von Hanseemann then founded the Neu Guinea Compagnie, which, in 1885, and together with Bismarck's support, received a far-reaching imperial charter to administer a new German protectorate in the region (Firth 1983; Sack and Clark 1979). Appropriate flag-raising ceremonies were carried out in the new territory. Hanseemann focused very largely on settlement of the north-eastern mainland of New Guinea, now called Kaiser-Wilhelmsland, which adjoined the south-eastern part and had been claimed by the British in 1884 as a protectorate. German names and spellings began to proliferate, some expansively, on maps, notably the Bismarck Archipelago, including Neu Pommern (New Britain), and the Bismarck Sea. Even a small volcanic peak inland from Blanche Bay and known locally as Vunakokor was named Mount Varzin, after Bismarck's country estate in Germany.

The New Guinea Company was concerned primarily with economic profit, with attracting European settlers and with developing new plantations and settlements. Asian immigration was encouraged for many tasks that the few Germans could or would not do (Cahill 2012), as was the immigration of labourers from islands such as Bougainville to work on the plantations. However, governmental administrative duties such as running a protectorate-wide judicial system and police force, formal relations with neighbouring countries and general military defence tended to be treated secondarily. Visiting naval warships of the Reich provided support where needed. There was also the hope that economically viable mineral resources might be discovered, and indeed gold was found to exist in the Waria River area of Kaiser-Wilhelmsland. This was much later, however:

in 1903, gold prospectors from British New Guinea crossed the border into the German protectorate and found colours (Nelson 1976). No goldmining industry was ever developed by the Germans.

Administrative headquarters for the New Guinea Company was established at Finschhafen on the mainland at the southern entrance to Dampier Strait, and Georg von Schleinitz—who had sailed into Blanche Bay at Rabaul in 1875—arrived at his new headquarters in June 1886 with his wife and children as the first *landeshauptmann* or administrator. Topographic and bathymetric mapping was carried out in the protectorate, including in the Blanche Bay area (Figure 1.13). However, there were serious health challenges for the Europeans living in Kaiser-Wilhelmsland. Almost 50 of them died from disease during 1887 alone, including Schleinitz's wife (Sack 1973).

Douglas Rannie, a self-described 'Sometime Government Agent for Queensland', visited Blanche Bay on 30 June 1887, anchoring off Matupit Island. He was visited by German officers and the manager of Hensheim & Co., 'entertained most hospitably' and taken to different sites around Blanche Bay that 'struck [him] at the time' as being, for Germany, 'an ideal harbour to transform into a great naval base for future operations in the world' (Rannie 1912, 282–3). Rannie was taken to

a mud island which had been thrown up about two weeks previously. There were springs of hot water still bubbling up from several places round it. The island stood about sixty feet high and was about three-quarters of a mile in circumference. (Rannie 1912, 282)

Here Rannie was apparently describing Vulcan Island, which had been created in January 1878 and not just 'two weeks' previously. His description of the features of the island, though very brief, if correct, is nevertheless of interest in that thermal activity (in the form of shoreline hot-water springs) was still taking place at Vulcan Island in 1887, nine years after the 1878 eruption. Rannie also wrote that at the north-western entrance to St Georges Channel, and before entering Blanche Bay, 'we could see the three active volcanoes on New Britain, named the Mother and Two Daughters, belching smoke high into the heavens' (Rannie 1912, 277). However, none of these volcanoes was geothermally active, either in 1887 or up to the present time.

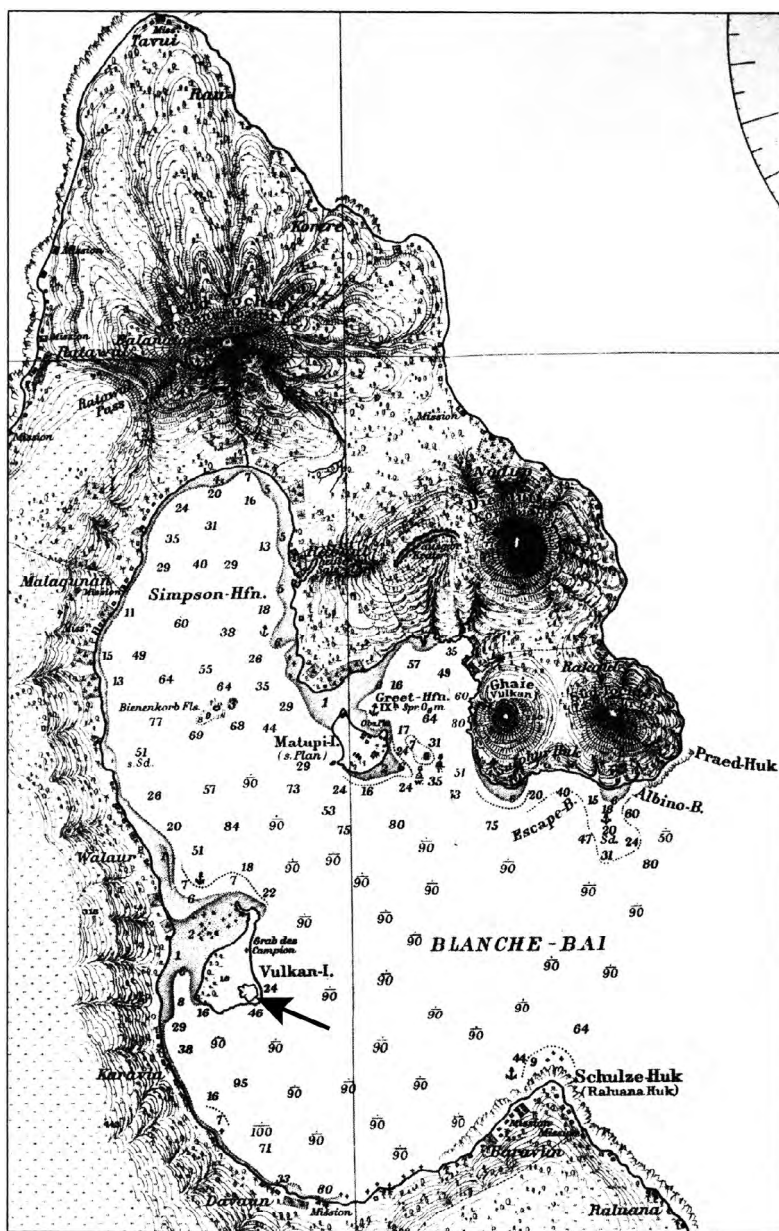


Figure 1.13. Bathymetric map of Blanche Bay, 1888.

The volcanoes of Blanche Bay are shown in this detail from a German chart drawn from surveys after the 1878 eruption of Blanche Bay, and now showing Vulkan I (Vulcan) and its 1878 crater (arrow). Note that 'Ghaie'/Matupi refers to Tavurvur volcano and that ghaie means 'kaia'. Source: Gazelle Halbinsel and Neu-Lauenberg published in *Nachrichten über Kaiser Wilhelms-Land und den Bismarck-Archipel für 1888* (Anonymous 1888). 1:100,000 scale chart.

The year 1888 was also challenging for German colonists. On 13 March 1888, a conspicuous active volcano in Dampier Strait originally known as Volcano Island but now named Ritter—after a German geographer—produced a devastating tsunami that swept onto the inhabited coasts of nearby western New Britain, the shores of adjacent islands such as Umboi and Sakar, and along the north coast of Kaiser-Wilhelmsland (Anonymous 1888a, 1888b; Cooke 1981; Johnson 1987, 2013; see also Figure 0.2). What, at Ritter, formerly had been a steep-sided conical island was reduced to an arcuate remnant and west-facing escarpment. Maximum run-up heights for the tsunami were 12–15 metres in Dampier Strait, decreasing towards more distant parts of the Bismarck Archipelago. The wave height was about 2 metres at Hatzfeldhafen on the mainland, almost 400 kilometres north-west from Ritter, but the oscillations had reached 7–8 metres by 8 am, threatening the station there.

The New Guinea Company's primitive 'capital' at Finschhafen was not directly in line with the main westward vector of the Ritter tsunami of 13 March 1888, but it was still vulnerable:

[S]hortly after 6.30 a.m. on this day, a noise like thunder was heard, and at the same time the sea and the harbour water was strongly disturbed, so that it rolled in and out and endangered moored vessels. The current was so strong that the reef south of the islet Madang was completely dry in about 2 minutes and stood about 5–6 feet out of the water. Then the water rose again with the same violence. The time between the lowest and highest levels was only 3–4 minutes. (Anonymous 1888a, 76, translated from German)

Tsunami waves were also recorded on Matupit Island in Blanche Bay at the other end of New Britain. An anonymous observer there reported:

[F]rom 0815 to 1100 the sea retreated from the island by 12–15 feet [4–5 metres] below its position at lowest tide and after that individual waves rose by just as much above the high water mark. The phenomenon revealed itself essentially on the southeast and northern side of the island while the western side remained untouched. The waves partially came from the south partially from the west-northwest. The water seemed to be stirred up in its depths. It looked turbid and carried dirty foam. Earth tremors or an underground roar were not noticed. The weather was clear and there was a weak southeasterly breeze. The natives by default, blamed the volcano, Alaia [probably Ghaie] opposite Matupi because the evil spirit dwelling there had been offended by the taking away pieces of

lava for building purposes. They fought the rising waves with sticks and threw stones at them with their catapults. (Anonymous 1888b, 148–9, translated from German; see also Wharton 1889)

The overall death toll from the Ritter tsunami is unknown but hundreds of coastal villagers must have lost their lives west of, and on the western coast of, New Britain; two Germans are also known to have perished. Ritter volcano for many years after 1888 was thought to have produced a major volcanic eruption and collapse like that of Krakatau in 1883, in the Dutch East Indies. However, any explosive volcanic activity at Ritter was comparatively minimal, and the cause of the tsunami was actually gravitational sliding of a huge segment of the volcanic cone westwards into the sea rather than collapse directly into an underlying magma reservoir. Tsunamis resulting from large volcanic landslides, as well as from sea floor earthquakes, can travel great distances and may become trapped in sheltered harbours; the name ‘tsunami’ derives from the Japanese for ‘harbour wave’. The waves entering in Blanche Bay and observed at Matupit Island may have interfered with one another, possibly in places producing amplification of wave heights. Volcano-related tsunamis had already been experienced 10 years earlier in Blanche Bay during the 1878 eruptions, so now the Germans could add ‘Ritter 1888’ to their colonial experience of volcanoes and what volcanic hazards to expect.

1.7. Creation of the New Colonial Capital

Administrator Georg Schleinitz in Kaiser-Wilhelmsland and Adolf Hansemann, the owner of the New Guinea Company in distant Germany, had conflicting opinions about development strategies for the struggling protectorate. However, Schleinitz, now a widower, resigned and left Finschhafen on 19 March, just five days after the Ritter tsunami disaster. During his time as administrator, Schleinitz had arranged for an administrative station for the New Guinea Company to be developed on Keraura Island in the Duke of York Islands, but it was abandoned. His successor, Rudolf von Kraetke, had decided by 1889 to purchase a large area of land near Ralum in the Kinigunan district on mainland New Britain. Richard Parkinson began work there on the new company station located at Kokopo—meaning ‘cliff’ or ‘landslide’. This terrace-like area was renamed Herbertshöhe, meaning ‘Herbert’s heights’, after Bismarck’s younger brother.

Eduard Hensheim on Matupit Island had recommended to Kraetke that picturesque Simpson Harbour within Blanche Bay was a far more suitable location for development, as the anchorages at Herbertshöhe were

unprotected and large-scale harbour works would be required for ships to anchor there during the north-west monsoon. German administration in the Bismarck Archipelago—but not yet the entire protectorate—was nevertheless transferred to Herbertshöhe in 1891. A French priest, Louis Couppé, in 1889 had become the first bishop of the Catholic Vicariate, the headquarters of which was built at Vunapope near Kinigunan. The ever-opportunistic Emma Forsayth at Ralum made her home at Gunantambu—a social centre where her young female relatives from Samoa were a magnet for unmarried male employees of the company. This entire area, including Ralum Plantation, Herbertshöhe and Vunapope, was now becoming established as an important colonial centre for the protectorate.

Eduard HERNSHEIM on Matupit Island in 1891–92 became anxious about his declining state of health, which

was made even worse by nerve-wracking, continual earth tremors and mysterious rumblings, which appeared to indicate an imminent eruption of the volcano [Tavurvur] just opposite my house. Towards the end of the year these phenomena became so imminent that my last remaining employees gave notice and left me, so that for some months I myself plus one clerk and a few Chinese remained the only inhabitants of Matupi apart from the natives ... [T]he menacing and unsettling natural phenomena were affecting my nervous system. (Hernsheim 1983, 114)

An eruption did not take place, but HERNSHEIM, aged 45, left German New Guinea on 14 May 1892 and returned to Germany, where ‘he could be confident that the income from his Pacific enterprises would allow him to lead a very comfortable life at home’ in Hamburg (Sack and Clark, cited in HERNSHEIM 1983, v). HERNSHEIM left the company’s business based on Matupit in charge of his new partner and nephew, Max Thiel.

A key person in this story of ‘Volcano Town’ is lawyer Albert Hahl (Firth 1978a; Hahl 1980). Hahl first came to the Neu Guinea Compagnie Protectorate in early January 1896 as imperial judge on a three-year term, arriving first at Friedrich Wilhelmshafen—locally also called ‘Madang’—in Kaiser-Wilhelmsland, now the capital of the protectorate. He soon moved on and, by 14 January, had reached his base in Herbertshöhe, New Britain, headquarters of the company in the Bismarck Archipelago. Hahl there was to be ‘the sole official of the Reich in the protectorate ... independent of the influence of the Neu Guinea Compagnie’ whose obligations were, as summarised by Hahl, to ‘attempt the economic development of the country by means of trade with the natives and by regular plantation agriculture on its own account’ (Hahl 1980, 3, 7). Hahl’s home afforded

a magnificent view over the wide expanse of sea sparkling in the sunlight, as far as the mountains of the volcanic peninsula at Matupi and past the islands of the Neu Lauenburg Group to the mountain ranges of Neu Mecklenburg which loomed dark on the horizon. (Hahl 1980, 9)

Herbertshöhe itself had become recognised as the main colonial centre. Hahl returned to Germany in 1899, where he transferred to the Colonial Service of the Foreign Office. His duties on his return to Herbertshöhe later in the year would have to take into account the recent purchasing by Germany from Spain of the Mariana and Caroline islands. This produced an 'Island Territory', followed in 1906 by the addition of the German Protectorate of the Marshall Islands—all adjacent to what became known as the 'Old Protectorate' (Firth 1983; see also Figure 1.14). There had also been agreement between the German Reich and the Neu Guinea Compagnie relating to transfer of sovereignty to the Reich. Rudolf von Bennigsen became the new imperial administrator, or governor, of the two-part German New Guinea. Hahl, who became vice-governor, was based in Ponape, but he returned to Herbertshöhe by June 1901, impressed by developments there, including construction of two new hotels: 'I would not have known the quiet little Kokopo of former days' (Hahl 1980, 83).

The year 1902 was critical in the 'Volcano Town' story: later that year, Hahl travelled back to Berlin for discussions with the Colonial Section of the Foreign Office, which 'knew that a good shipping service was essential' in the Pacific (Hahl 1980, 94), and the need to hand over the construction and operation of a new ship, the *Stephan*, to Norddeutscher Lloyd was identified. Hahl next travelled to Bremen for discussions of future plans in German New Guinea with the general manager of Norddeutscher Lloyd. 'These plans envisaged the creation by the Lloyd on Simpson Harbour of a permanent base for coastal shipping, including the construction of a wharf and the necessary warehouses.' Agreement was eventually reached that the company would 'establish a commercial base and an entrepôt port on Simpson Harbour' (Hahl 1980, 95). In other words, Herbertshöhe would not be that port. There is no known record of whether the geological risks involved in building new facilities in Simpson Harbour were discussed in Bremen, nor whether any attempt was made to prepare comparative costs for the construction of suitable wharf facilities at Herbertshöhe. Similarly, there is no known record of any conversations Albert Hahl and Eduard HERNSHEIM may have had when they met in Colombo in 1898 about the advantages of Simpson Harbour for shipping—a view that HERNSHEIM had always favoured (Figure 1.15).

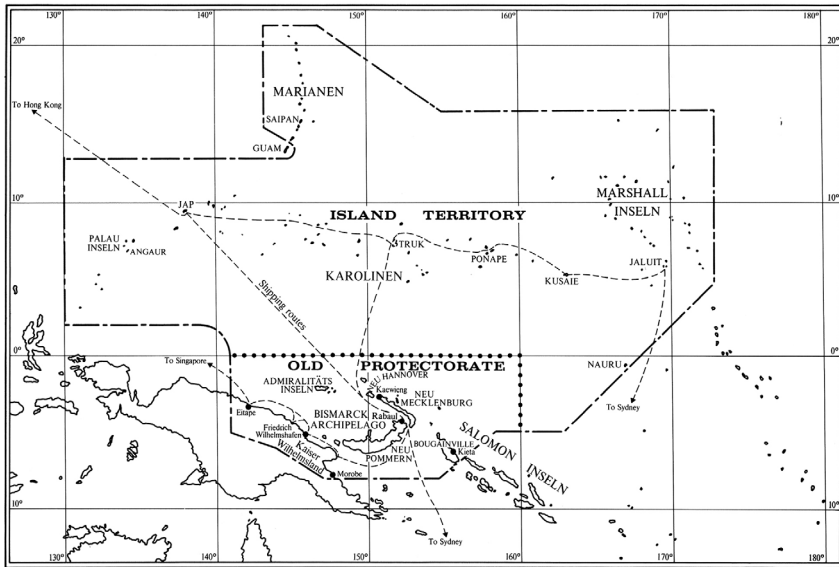


Figure 1.14. Geography of the Old Protectorate and Island Territory in German times.

The two constituent territories of German New Guinea are shown in this map (taken from Hahl 1980, Map 1). Principal shipping lanes are shown passing through St Georges Channel, connecting with Hong Kong, Sydney and Singapore. Guam in the north-west was and still is US-held.

Hahl returned to German New Guinea and, in November 1902, was appointed governor of the protectorate to succeed Herr von Bennigsen. He later reported:

The Norddeutscher Lloyd had lost no time in translating into fact the promise given in Bremen [in 1902]. The first experts arrived as early as 1903; soundings and surveys were carried out in the harbour of Rabaul; the steamers brought building materials; a great wharf was completed and on it were erected warehouses and water tanks; the foreshore was cleared and houses and office buildings went up. By the end of 1904 the installations were opened for shipping. (Hahl 1980, 115; see also Figure 1.15)

Also, Norddeutscher Lloyd was granted a monopoly for shipping goods to and from Rabaul, which 'dealt a severe blow to the Australian firm Burns Philp & Co.' (Hahl 1980, 115).

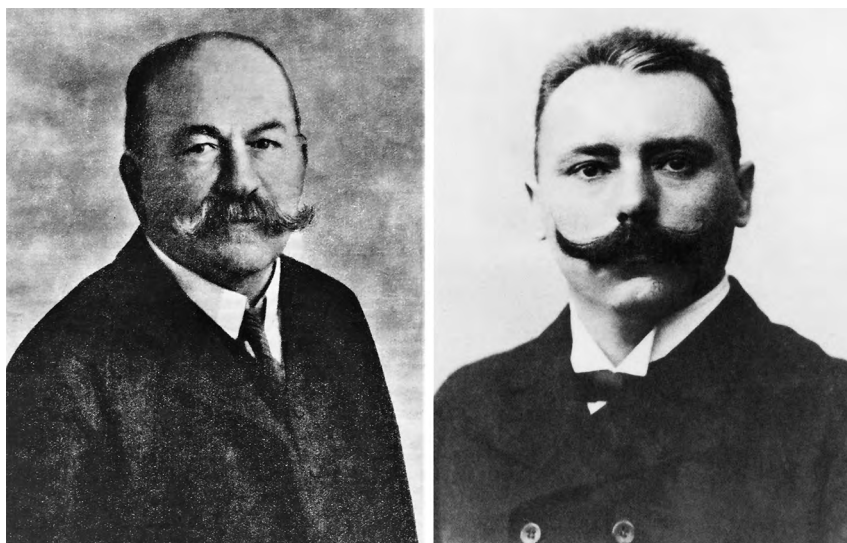


Figure 1.15. Portrait photographs of Eduard HERNSHEIM and Albert Hahl in later life.

The photograph on the left of Eduard HERNSHEIM in later life is from the *Hamburger Fremdenblatt* for 24 April 1917 (no. 112B, evening edition, p. 9). The photograph of Albert Hahl on the right is from the frontispiece of Hahl's 1980 book; an original print of this portrait was supplied to editor Peter Sack and reproduced courtesy of the Hahl family.

English writer Bessie Pullen-Burroughs travelled widely in 1906–07, visited New Britain probably for four weeks, and was hosted and guided by German residents in the Herbertshöhe and Blanche Bay area (Pullen-Burroughs 1909). She met there the Austrian anthropologist Richard Thurnwald, who was undertaking linguistic and anthropological studies in the German colony. Pullen-Burroughs also experienced an earthquake whose strength, some of her hosts declared, would prove to be the severest felt, so far, during German times. 'Evidently the Mother [volcano] was responsible for the quakes', Pullen-Burroughs wrote, noting also that the waters of Blanche Bay were 'abnormally agitated between the shore and the volcano' (Pullen-Burroughs 1909, 228–9). Further: 'Looking westward [sic] across the bay, I recognised the all-powerful Mother, whose eruptive playfulness I had already experienced several times' (Pullen-Burroughs 1909, 220). However, Pullen-Burroughs is almost certainly incorrect that the extinct Mother volcano was responsible for the geophysical unrest at this time. Other visitors to the Herbertshöhe area around this time were Lily and Karl Reehner, botanists from Vienna. They were able to use the *Seestern* (Figure 1.16) to explore the Blanche Bay area and to visit Matupit Island (Figure 1.17) as well as Tavurvur, commenting on its botany (Reehner and Reehner 1908).



Figure 1.16. The German steamer *Seestern* on Greet Harbour.

Governor Albert Hahl wrote that the arrival of the government steamer, the *Seestern* — for use by the governor and officials throughout German New Guinea waters — ‘was the highlight of the year 1903’ for the colony (Hahl 1980, 101). The date of its arrival in New Britain was 21 August 1903 (*Sydney Morning Herald* 1904). The *Seestern* is seen here left of centre anchored in Greet Harbour. The vessel is bedecked with flags on the occasion of an official jubilee ceremony (foreground) on 4 November 1909 commemorating the raising of the German flag on Matupit Island in 1884 (Overlack 1972–73, image on p. 134). The photograph was taken from Matupit Island looking north-eastwards across Greet Harbour towards the peak of the Mother (Kabiu) volcano.

The severe earthquake felt by Pullen-Burru may have been the one that took place on 14 September 1906. By this time, seismographs had been installed in different countries worldwide, such that instrumentally recorded data for large earthquakes could be shared and calculations made of the size and location of each earthquake. This 1906 event was assigned the large-magnitude value of 8.1 and given an epicentre, to the nearest degree, of 7°S latitude and 149°E longitude (Sieberg 1910; Gutenberg and Richter 1954). The earthquake, notably, is also the oldest one listed in a table compiled in the early 1960s for numerous principal earthquakes in New Guinea and Papua between 1906 and 1962 (Brooks 1965, Table 1). Its poorly defined epicentre, however, represents a point in the western Solomon Sea hundreds of kilometres from Rabaul (Figures 6.5 and 6.10).

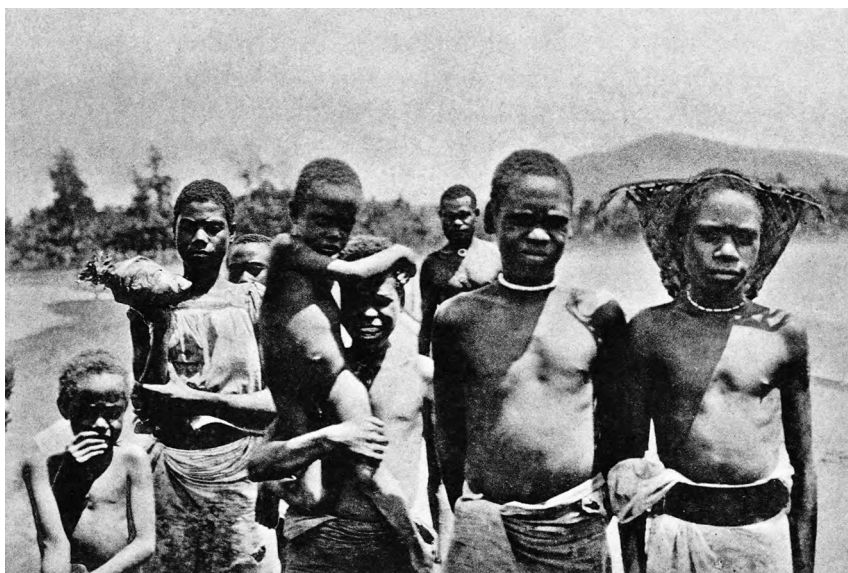


Figure 1.17. Matupit children in 1906–07.

This photograph of children on Matupit Island was published in the book by Lily and Karl Reching (1908, tafel 2). The children would have been born after the 1878 eruption at nearby Tavurvur just across Greet Harbour. The volcanic peak in the background is Tovanumbatir to the north.

Meanwhile, Governor Hahl was proceeding with his development of the new town on Simpson Harbour irrespective of earthquakes:

Rabaul grew apace. The major firms were anxious to secure suitable blocks of land in this fast-growing port ... The extensive plain round the bay ... had to be surveyed and an appropriate townplan prepared. There was provision for a business section near the life-giving wharf; residential sections; a special quarter for the Chinese and another for the Melanesians. (Hahl 1980, 115)

The town plan covered the low, flat land around the north-eastern corner of Simpson Harbour, where swampy areas of mangrove (*ra-baul*) had to be drained. Rabaul's main business district was in the south-east, looking westwards out across the waters to Malaguna and Dawapia Rocks and to the western escarpment of Blanche Bay. A botanical garden was designed for the north-eastern part of the town on the slopes of North Daughter volcano, and lines of trees were planted along some streets, later providing welcome shade for times when the weather was hot and windless. The new town appeared in some ways idyllic, yet its southern edge was close to Sulphur Creek volcano and, from many points, there were clear views towards

Tavurvur, the active volcano that, in 1878, had erupted explosively during the monsoon season sending ash mainly to the south-east. The position of the new town of Rabaul was now in the ash fall zone from Tavurvur during the south-east trade wind season. Rabaul's generally low height above sea level (compared with the 'heights' at Herbertshöhe) also meant that the town was more susceptible to tsunamis that might become trapped in the harbour, creating seiches. Flooding of the town could be a problem too, particularly where water streamed off the escarpments near the edge of the town after torrential downpours. Poorly constructed buildings in both Herbertshöhe and Rabaul might also be susceptible to ground-shaking caused by both local and regional earthquakes.

Building of the new town and its wharves had advanced significantly by 1908. This was also the year that Professor Karl Theodor Sapper, a German scientist from the University of Tübingen, travelled to the Bismarck Archipelago and Solomon Islands as part of the Sapper–Friederici Expedition of 1908–09. The study area also included north-eastern New Britain. Sapper came to German New Guinea in 1908 with considerable volcanological expertise on the nature of explosive volcanic eruptions and their hazardous impacts (Termer 1966; McBirney and Lorenz 2003). He was 42 years old in 1908 and had spent his early years in volcanically active Central America and southern Mexico, later developing further experience through extensive fieldwork in ethnology, geography and geology, including volcanology and geomorphology. He had made a visit in 1902–03 to Mount Pelée volcano on the small island of Martinique in the Caribbean to investigate the disastrous eruption that had just taken place there. Thousands of people in the town of Saint-Pierre had been killed by a searing cloud of ash, rocks and dust that had raced down the flanks of the volcano on 8 May 1902 (Lacroix 1904).

Albert Hahl had not invited Karl Sapper to visit German New Guinea, so far as is known. Rather, the German Colonial Office had ordered Sapper to the area, almost certainly because of his specific volcanological experience (McBirney and Lorenz 2003). The implication, although speculative, is that someone in the Colonial Office had concerns about the new development going on in Simpsonhafen in the shadow of so many volcanoes and required some professional volcanological advice. In addition, at least some of the planter community, particularly of the large and influential trading companies, were not supportive of some of Hahl's colonial policies, and perhaps had expressed some concern to Berlin about his decisions. Rather than local people becoming better educated and more self-reliant in a changing world, which was Hahl's policy, the companies required a

compliant labour force for their commercial plantations. However, a better port at Rabaul would provide the companies with an improved international shipping service, so they could hardly criticise Hahl for that.

Much of Sapper's and Friederici's time was spent surveying the geology, geography and ethnology of New Hanover and New Ireland, as well as the offshore volcanic islands of the Tabar-Feni group (Sapper 1910a). Albert Hahl and Karl Sapper together crossed Bougainville Island from east to west in mid-July 1908, supported by 50 Melanesians—20 soldiers and 30 carriers—and accompanied by American ethnologist G.A. Dorsey and government officer A. Doellinger (Sapper 1910b; Hahl 1980). Balbi and Bagana volcanoes, both thermally active, were seen during the crossing. Sapper also spent time in Blanche Bay examining the active volcanoes of Palangianga/Rabalanakaia, Vulcan Island and Ghaie or 'Taburbur' (Tavurvur), as he called the volcano on Greet Harbour (Sapper 1910c). There is no known record of the conversations held between the governor and the professor about Rabaul, volcanoes or volcanic hazards, and Hahl does not refer to Sapper's Rabaul investigations in his memoirs or even to Sapper's considerable volcanological expertise. There is no doubt, however, that Sapper had serious concerns about the volcanic risks involved in developing the new capital at Rabaul. He wrote that the Rabaul eruption of 1878 was 'a warning to the inhabitants of Blanche Bay' and that there was

the question whether it was advisable to establish the new capital of the territory at Rabaul in this endangered area of Simpson Harbour. It is of course possible that the volcanic force will lie dormant for decades, even centuries, but it is also possible that it will soon become active again; nothing could be more unpredictable. (Sapper 1910c, 191; see also Sapper 1937)

Engineer Ludwig Kohl in 1909 also warned of future volcanic activity and referred to the need for geodetic measurements:

In all likelihood the whole area—the Mother–Matupi–Vulcan Island area—is involved in a relatively marked movement of elevation, so that frequent surveys will be necessary. Movements of elevation frequently and suddenly occur in association with earthquakes. (Cilento 1937a, 3; 1937b, 39)

Neither Sapper nor Kohl was in a position in 1908–09 to argue that the shift to Rabaul be reversed, but Sapper did offer the following practical advice for volcanic-risk reduction:

[P]rovision should be made to alleviate the effects of further volcanic eruptions or devastating earthquakes by specially constructed dwellings, which should be kept low and built of timber to offer maximum resistance to earthquakes; on the other hand, they would have to have steep roofs so as to render harmless a rain of ash or pumice [which] cannot settle on a steep roof and will slide off. (Sapper 1910c, 193)

Karl Sapper, after leaving German New Guinea, maintained an interest in Rabaul volcano and in New Guinea volcanoes generally in his later volcanological papers, including his benchmark book *Vulkankunde* (Volcanology), albeit briefly (Sapper 1927), and notably in 1937 (Sapper 1937). Other German scientists interested in volcanoes and their eruptive activity incorporated New Guinea examples in their work, including K.L. Hammer (1907), A. Wichman (1912) and, later, G. Hantke (1939).

German marine surveyors and navigation technicians also worked in the Blanche Bay area in these early century times. Earthquakes were felt on board vessels that moored in Greet Harbour in 1909, although they were referred to by the mariners as ‘seaquakes’ (Südsee-Handbuch 1920, 41). A notable visiting vessel was the German Navy’s hydrographic surveying vessel, SMS *Planet* (Figure 1.18), which operated throughout several parts of marine German New Guinea (Intemann 2017). SMS *Planet* is famous for its deep-sea soundings in 1909–10 of the sea floor trench that runs eastwards south of New Britain, then south-eastwards down the south-west side of Bougainville Island. The greatest depth or ‘deep’ recorded in the south-east was 4,998 fathoms (9,140 metres), and 4,050 fathoms (7,407 metres) south of New Britain (Südsee-Handbuch 1920, 20). This major discovery would have strong implications decades later for ideas about the tectonic plate development of New Britain and its volcanoes, including those on Blanche Bay. The deepest part of the submarine trench off Bougainville Island is commonly referred to even today as the ‘Planet Deep’.

‘Seaquakes’ were felt in Greet (or Matupi) Harbour and in the wider Blanche Bay area on 18, 19 and 20 February 1909, and again on 18, 19 and 26 November. Others were felt in the early morning of 8 December 1909, when

eight shocks of longer duration were observed. The longest shaking lasted thirty seconds. This shook the whole ship (S.M.S. *Planet*) severely, so that almost the whole crew awoke. Some of the men came on deck in the belief that danger threatened the ship ... On board

S.M.S. *Kormoran*, which also was lying in Matupit harbour, almost the same phenomena were noted. During the 8th and 9th December several minor seaquakes without special phenomena were observed. (Südsee-Handbuch 1920, 41)

Residents were again reminded of the geological instability of the Blanche Bay area early the next year:

During the night of 24th–25th February, 1910, there was a severe earthquake in Matupi. It began without previous warning, with a severe shock four seconds long ... About a minute later the phenomenon was repeated; the second shock was six seconds long. The first had been immediately followed by a moderately heavy swell from the south-east. The compass showed a deflection of four points—north-east to north ... [Six other shocks were recorded between 12.52 am and 12.56 am.] Between 12.50 and 2 a.m. a strong sulphurous smell was noticed. This was the heaviest seaquake for many years. On shore the shocks were markedly vehement, and in houses lamps, pictures, crockery, &c., were thrown down. (Südsee-Handbuch 1920, 42)

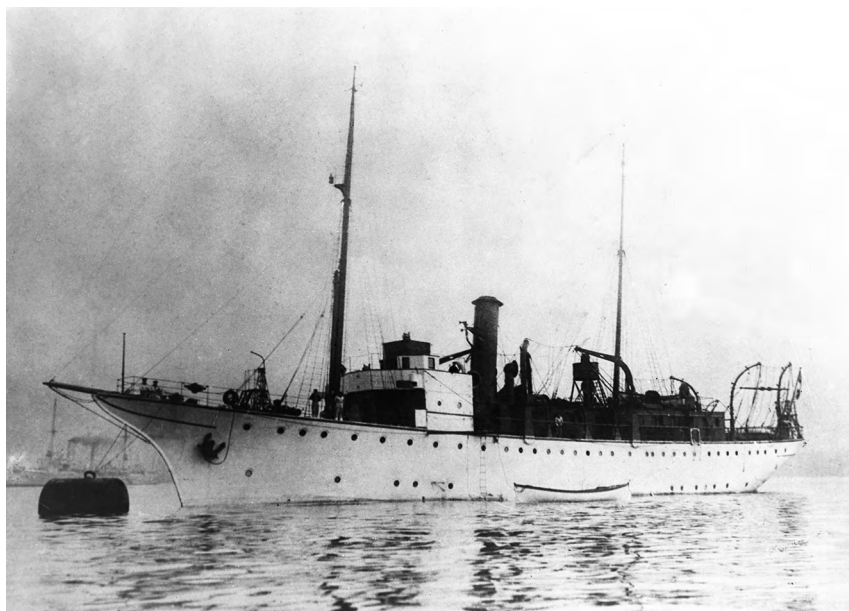


Figure 1.18. SMS *Planet* in still waters.

The German hydrographic vessel SMS *Planet* is seen in this digitally enhanced image from a photograph kindly provided by the Universitätsbibliothek, Goethe-Universität Frankfurt.

The precise location of this distant earthquake sequence in February 1910 appears to be unknown, but another strong earthquake later that year, on 7 September, was measured instrumentally (Brooks 1965). The approximate position of this later event was beneath the south coast of New Britain (151°E, 6°S; depth 80 kilometres) about 240 kilometres south-east of Rabaul. Its magnitude was estimated to be '7 ¼' (Brooks 1965, Table 1).

Kommandant K-Kapt (Korvettenkapitän) Habernecht of SMS *Planet* published a short note on an earthquake felt in Greet Harbour on 8 September 1911, together with a tide-gauge record that showed the height of the wave from a small tsunami that followed to be only 20 centimetres (Habernecht 1912).

Governor Hahl wrote that Rabaul by 1909 'had long since outstripped in importance the town of Herbertshöhe, which had become a sleepy hollow'. He also had been 'forced to transfer some Government offices [from Herbertshöhe] and to increase the staff' in order to service the increased trade and communications at Rabaul (Hahl 1980, 131, 133). Hahl remained that year 'in lonely splendour in Herbertshöhe', but he allocated funding—without prior approval from a later disapproving Colonial Office in Berlin—to complete the move to Rabaul, which in 1910 became the new capital of German New Guinea (Hahl 1980). A neat network of tree-lined streets and roads was laid out beneath and between North Daughter and Rabalanakaia volcanoes, forming the basis for an attractive but vulnerable tropical town.

The town by 1913 was well developed (Figure 1.19). Three wharves had been constructed adjacent to the main part of the town in the south-east where there was a treasury, post office and district court. The town was home to German administration-run departments of agriculture and health, but there was no provision for a volcanologist or volcanological observatory. Government House, a home for the governor, had been built on the cooler heights of Namanula Hill together with a European hospital and school. The town was multiracial and racially stratified. White Europeans constituted the top layer, followed by Asians in the middle—including Chinese, Malays and Ambonese—followed by Melanesians at the bottom. The Japanese were readily accepted by the whites, especially successful businessmen such as boatbuilder Captain Isokide Komine. Chinese businessmen such as Lee Tam Tuck, known best as Ah Tam, were also successful. Both Komine and Ah Tam ran businesses along the foreshore in the western part of the town where the native hospital was located (Figure 1.19). Hahl's opinion

of the Chinese was no-one 'wished to or was able to do without [them], but no-one wanted to have them in the country' (Hahl 1980, 145; see also Cahill 2012).

Hahl recorded that the passage between Matupit Island and the mainland to the north was in 1895 '16 feet deep and in 1913 totally dry', thus referring to sea floor uplift in this area (quoted in Fisher 1939a, 17). A causeway had been built by the Germans across the passage but it was submerged at high tide after 1913–14, implying some sea floor subsidence. Earth movements in the Matupit area would also be recorded in the years afterwards—clear indication of geological instability of this part of Blanche Bay.

No formal risk assessment was made of Rabaul town and its environs, so far as is known. However, the main part of Rabaul was vulnerable, being restricted to a coastal flat and hemmed in by steep escarpments on one hand and by the sea on the other (Figure 1.19). Timely evacuation out of Blanche Bay using vessels might not be possible if there was no forewarning of eruptive activity from the active volcanoes. Two trafficable roads led out of town, one westward towards Malaguna, then eventually out of Blanche Bay towards either Herbertshöhe to the south or northward over the ridge to Ratavul on the north coast. The other route was eastward up and over Namanula Hill and then down the eastern slopes to the shores of St Georges Channel. Evacuations triggered by volcanic eruptions were not required by the people of Rabaul during the short remaining time of what was known as German New Guinea.

People living in the Rabaul area in 1913–14 probably were becoming less apprehensive about volcanic hazards as they were also having to cope with another natural hazard: drought. They were concerned, too, by the building up of serious political tensions in Europe, where a war involving Germany seemed a real possibility. German New Guinea was a long way from its home country and even though ships of the German Navy patrolled the Western Pacific, the colony had very few men trained militarily, and the coastal towns of Rabaul and Herbertshöhe were clearly vulnerable to any major naval attack from a hostile enemy. International radio communications were not the best either, although a radio station was being built defensively at Bitapaka several kilometres inland and south-east of Herbertshöhe as part of a German telecommunications network for the region and the German Navy. A successful defence initiative of Rabaul and Herbertshöhe against a determined invading force such as from nearby Australia was, therefore, unrealistic.

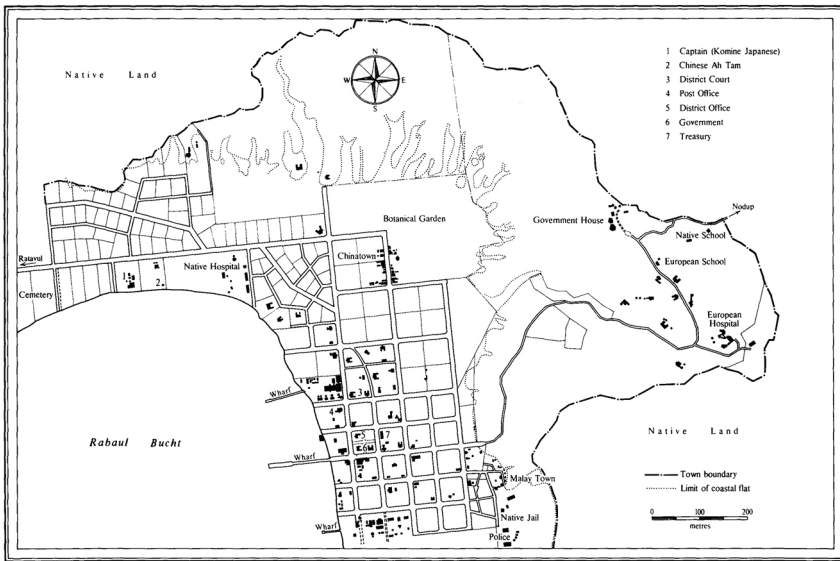


Figure 1.19. Map of Rabaul town in 1913.

The restriction in German times of Rabaul town to flat land mainly hemmed in by escarpments and the sea is shown in this town plan from 1913 (Sack and Clark 1979, Map 5). A road winds eastwards up to the cooler heights of Namanula Hill where Government House was built.

Albert Hahl did not have to wrestle with the challenge of possible invasion of the colony because he left German New Guinea in April 1914. Then, soon after reaching Germany,

he was abruptly relieved of his post as governor, ostensibly because of ill-health. Though the facts are still unclear, he was almost certainly forced to resign, probably as a result of pressure on the German government from dissatisfied plantation companies or perhaps because the Kaiser was displeased at his failure to develop the Waria goldfields. (Firth 1978a, 44)

Another reason might have been Hahl's development of Rabaul as the colony's capital without prior sanction to do so from his Berlin masters.

This text is taken from *Return to Volcano Town: Reassessing the 1937–1943 Volcanic Eruptions at Rabaul*, by R. Wally Johnson and Neville A. Threlfall, published 2023 by ANU Press, The Australian National University, Canberra, Australia.

doi.org/10.22459/RVT.2023.01