4. Volcanic Events of the German Era: 1884–1914

There is ‘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’.

Karl Sapper (1910c)

Colonial Partitioning

A diverse mix of new Europeans became established in the St Georges Channel area in the years following the 1878 eruption at Rabaul. Roman Catholic missionaries, for example, arrived in 1882, gaining a mission foothold in competition with the Methodists, and Ludwig Couppé came later as bishop, strengthening the Catholic base at Vunapope at present-day Kokopo. Trader Thomas Farrell and his partner, Emma Coe, arrived there too from Samoa, acquiring large tracts of land from the Tolai, and eventually creating a successful plantation economy and great personal wealth for the legendary ‘Queen Emma’. German traders in general — particularly Eduard Hernsheim and those requiring New Guinea labour in Samoa — had lobbied the Reich in Germany for establishment of government protection for their commercial activities and interests, but Chancellor Otto von Bismarck was reluctant to raise the German flag and claim colonies — at least until 1884.¹

The governments of the Australian colonies had also lobbied the British Government in London, urging a claim on at least part of New Guinea in order to counter the potential threat of foreign powers — in particular Germany — becoming established on Australia’s doorstep, but there was resistance in London too. These different pressures came to a head in 1884 when agreement was reached between the German and British governments to partition, and establish protectorates over, the areas east of 141°E. The Dutch, much earlier, had claimed New Guinea west of this meridian. Germany took north-eastern New Guinea together with the Bismarck Archipelago and Bougainville Island, and the British established a protectorate in south-east New Guinea — British

¹ See, for example, Whittacker et al. (1975, Documents D22–36) and Gash & Whittacker (1975) for background information on colonial partitioning in Near Oceania.
New Guinea. Thus began a remarkable 30 years of German colonial rule, during which there would be expeditions, much scientific activity and significant volcanological happenings.

The British by 1884 had already been obtaining volcanological information from the Solomon Islands, which extended from the volcanically active Bougainville Island in the north-west to the older San Christoval Island in the south-east. This was largely the result of Royal Navy vessels making periodic calls to the islands following Carteret’s visit there in 1767, but European missionaries, traders, and travellers, as well as ‘blackbirders’ exploiting Melanesian labour, had also visited the islands during the course of the mid- to late nineteenth century. Britain finally exerted control over part of the Solomon Islands in 1893 when it established a protectorate over the south-eastern islands. Ownership of islands in the north-western Solomons, which had been claimed originally by Germany, was transferred to Britain in 1900 by means of a treaty, leading to establishment of the separately administered British Solomon Islands Protectorate, but excluding Bougainville Island which remained under German control. The Melanesians themselves had no negotiating involvement in any of these colonial machinations and decisions.

Dr H.B. Guppy was appointed surgeon to the British naval vessel HMS Lark in 1881, in part because of his interests in natural history, and in this capacity he undertook visits to the Solomon Islands over the next three years. Guppy noted that Bagana on Bougainville Island was the only active volcano in the Solomon Islands chain. He saw Bagana from west of the Shortland Islands on several occasions during 1884 and gave the only known report of deaths by eruptions from this volcano:

A white column of vapor appeared to be constantly issuing from its summit … it has the appearance of an isolated conical mountain somewhat truncated … At the end of April 1884, I learned from Gorai, the Shortland chief, that about four months before there had been a great explosion in this volcano by which a number of natives were killed. From what I can gather from various sources, it would seem that this vent has been in continual eruption for at least fifteen or twenty years.

Guppy also described Savo volcano in the strait north of Guadalcanal, based on information provided by others, and noted both its potentially active state and the local stories of its past eruptions. He also hinted at the parsimony of British interest in the region, remarking — after ‘stifling’ his British patriotism — that

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3 A systematic search in the vast holdings of German colonial literature for references to volcanic activity in German New Guinea has never been undertaken, so new information is almost certainly yet to be discovered.
4 Guppy (1887b), pp. 21, 22.
I cannot but think that the presence of Germany in these regions will be fraught with great advantage to the world of science ... and conducted with that thoroughness which can only be obtained when, as in the case of Germany, geographical enterprises become the business of the State.  

The German Reich initially, in 1885, provided an Imperial Charter for the running of the new protectorate to the Neu Guinea Compagnie, which concentrated its surveying, development, and settlement efforts along the north-eastern coast of New Guinea Island — called Kaiser-Wilhelmsland by the Germans. The company’s aim was to establish a plantation colony that would be run commercially in the interests of a European minority, and the European and Tolai communities on the shores of distant St Georges Channel were left much to themselves, at least for the time being. Ornithologist and anthropologist Otto Finsch had come to the area in 1884 and, from a base in the Duke of York Islands, led ostensible natural-science expeditions along the Kaiser Wilhelmsland coastline. His primary aim, however, was to identify coastal lands that were both suitable for plantations and settlements, and close to harbours from which produce could be exported. 

Finsch had several opportunities to observe and describe the volcanoes off the New Guinea north coast, including eruptive activity at Manam, thus adding to the series of European observations of this volcano that had begun in the sixteenth century. He described for the first time a feature that would later intrigue volcanologists studying Manam — its sound effects:

We went along the west coast close to shore and saw the island in all its imposing beauty before us. Once the engine was stopped, one could hear the subterranean forces at work, a powerful booming becoming constantly louder, that passed into a weaker moaning and groaning, until it became completely silent for a while, and then soon started up anew. The wondrous, uncanny noise was reminiscent of a giant pair of bellows, and up above, from the flue, vast masses of white smoke came rolling out; truly one of Nature’s subterranean workshops, which fills the observer with mute admiration.

**Ritter Island Disaster**

Administrative headquarters for the New Guinea Company were established at Finschhafen on the mainland at the southern entrance to Dampier’s Strait, and G.E.G. Schleinitz — who had sailed into Blanche Bay at Rabaul in 1875 —

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5 Guppy (1887a), p. xii.
arrived at his new headquarters in June 1886 with his wife and children as the first *Landeshauptmann* or administrator. Schleinitz was active in mapping the coastlines of northern New Britain and Kaiser Wilhelmsland and, in so doing, observing volcanoes and their activity. His mapping of north-coast New Britain established clearly that the ‘islands’ mapped by D’Entrecasteaux in 1793 and Powell in 1878 were in fact part of New Britain Island, and that Willaumez was indeed a volcanic peninsula.7

**Figure 23.** Otto Finsch reproduced this picture of Manam volcano in his 1888 memoir. The two hills to the left of one of Manam’s four radial valleys are small satellite volcanoes near the south coast of the island. Vapour is emerging from the southern crater of the volcano.

Source: Finsch (1888, between pp. 366 & 367.)

The challenges facing the New Guinea Company were substantial and eventually became insurmountable, causing failure in both the commercial and colonial sense. There was confusion, for example, over who was responsible for law enforcement — the company, which was a commercial enterprise, or the German navy, which could bombard recalcitrant villages from the sea, but had little capability to penetrate on foot into the rainforest. Tropical diseases took a devastating toll, and nearly 50 of the small number of Europeans in Kaiser Wilhelmsland in 1887 died, including Schleinitz’s wife.8 The experienced Hernsheim, who seems to have had little time for Finsch anyway, blamed the naturalist for the recommendations on settlement that had been made to Berlin.9

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7 Schleinitz (1896, 1897).
8 Sack (1973).
Schleinitz himself had had enough of dealings with Berlin and left on 19 March 1888, only days after a catastrophic event at Ritter volcano\(^{10}\) in nearby Dampier Strait added to the list of concerns for the Germans at Finschhafen.

The steep, frequently active ‘volcano island’ that William Dampier had seen in impressive eruptive behaviour in 1700 was a well known feature to ships passing through Dampier Strait, but what happened shortly before daybreak on 13 March 1888 will never be known fully. Geologists and others for years afterwards deduced that the volcano must have behaved just as Krakatau had done in 1883 in the Dutch East Indies, and certainly, like Krakatau, most of Ritter Island did indeed disappear suddenly beneath the sea, producing a devastating tsunami. The sparse and distributed contents of German records of the event, however, did not receive careful attention by volcanologists until R.J.S. Cooke compiled information in the late 1970s.\(^{11}\)

The steepness of Ritter volcano was perhaps its most conspicuous feature before 1888. Several mariners had commented on this. Some of them even produced illustrations of it, portraying slopes well in excess of 50° which is probably too steep in some cases, given the general penchant of illustrators of those times to exaggerate the slopes of volcanoes. An angle of 50° is much greater than the slopes of volcanoes of this type elsewhere in the Bismarck Volcanic Arc. Nevertheless, the general steepness can be accepted as real in view of what happened on 13 March 1888. Observations of eruptions at Ritter had been made previously and, by 1888, it was perhaps the best known volcano in the region except, possibly, for Manam. Ash had fallen on Finschhafen in February 1887, accompanied by earth tremors that, according to Schleinitz, caused ‘wall clocks to stop at once, and their pendula and clock weights, and hanging lamps, to swing violently’.\(^{12}\) The source of the ash could have been Ritter, but there are in any case no other reports of Ritter eruptions after this and before 13 March 1888. The following are translated extracts of observations made at Finschhafen on the morning of 13 March:

a noise like thunder was heard shortly after 6.30 in the morning, and at the same time the sea and the water in the harbour started to move with surging rapidity in such a way that it flowed up and down and the ships in the harbour were in danger. The water fell so sharply that the reef south of the wooded island Madang was dry in 2 minutes and stood 5–6 feet out of the water. Then the water came back with the same force. The time between the lowest and highest level was 3 to 4 minutes, the speed of the current was reckoned to be 8 to 10 knots … After the arrival of the tidal wave [tsunami], some observers noticed a fine, barely perceptible rain of ash.\(^{13}\)

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\(^{10}\) The Germans named the volcano after the pre-eminent German geographer, Carl Ritter (1779–1859).

\(^{11}\) Cooke (1981).

\(^{12}\) Anonymous (1887), p. 211.

\(^{13}\) Anonymous (1888), p. 76.
Little damage was done to European infrastructure at Finschhafen, but Melanesian people there lost canoes and shoreline houses. Some of them believed Governor Schleinitz had supernatural powers, knew that he was about to leave New Guinea within a few days, and suspected that he had caused the tsunami by casting a spell. A small New Guinea Company expedition from Finschhafen consisting of two Germans, four Malaysians and 12 Melanesian labourers from the Duke of York Islands, had arrived on the west coast of New Britain on 6 March, planning to survey sites for a coffee plantation, but the German captain of the ship, attempting a rendezvous with the party on the evening of 15 March, found the coastline completely changed by the destructive impact of the tsunami. He returned to Finschhafen with flags at half mast on 16 March, when Schleinitz organised a relief expedition to be sent back immediately to New Britain. The aim was to look for any survivors, but evidently was motivated primarily by the suspected loss of the two Germans. Only five young labourers from the party had survived. They had been carried into trees by the wave and had then clung to branches as the waters receded. Trees that remained standing had signs of the waves reaching heights of about 10 metres.14

Figure 24. This simple profile of Ritter Island, produced by Schleinitz in about 1887, is perhaps the most realistic of all the sketches of Ritter provided by pre-1888 observers. Note that the slope is a good deal less than is shown in Dampier’s sketch of 1700.

Source: Schleinitz (1896, plate 8). See also Cooke (1981, figure 2D).

There is no clear indication from the account of the relief party of major losses of life having resulted from the Ritter tsunami along the shorelines of Kaiser-Wilhelmsland. Indeed, the relief effort apparently represented more a commercial company interested in the immediate fate of its employees than representatives of a government being concerned about the condition of its subjects. One of the members of the relief party identified 17 species of orchid during the expedition. This is suggestive of an element of distraction from what might have been expected to be the main task at hand, and even some disregard by the white settlers towards the black Melanesian villagers who perished as a result of the tsunami. Yet the total number of deaths must have been substantial as many villages were scattered along the coastlines of west New Britain, Umboi

14 Steinhauser (1891–1892).
and Sakar islands, and on nearby mainland New Guinea. Population figures are not known for the area, but missionaries had been attracted to the villages of Dampier Strait for religious work amongst the coastal Melanesians since the 1840s. Fatalities in 1888 are likely to have numbered in the hundreds, and possibly more than 1,000.

The captain of a German vessel, returning later to the area, wrote:

On Tupinier [Sakar] and Rook [Umboi] Island in particular the devastation caused by the tidal wave must have been terrible. Even today, more than two years later, a sharply defined strip, approximately 40 to 50 feet [12–15 metres] above sea level and running parallel with the coastline, clearly defines the path of the masses of water. Collapsed forests and mountain sides which have slid down will bear witness to the disaster for some time to come. Many people must have perished on populous Rook Island. At Marienhafen [on the southeastern end of Umboi] where I had seen masses of canoes on a previous visit, no trace of natives could be found.

Another report contains the statement that ‘The formerly populated Lutherhafen [at the north-western tip of Umboi] was completely abandoned. According to the old headman hundreds of people have perished. The survivors have fled to the mountains and do not dare to come down to the beach.’

Notable features of the event in the German accounts are, first, the almost complete disappearance of Ritter Island, leaving today only a scalloped remnant and islets and, second, the apparent absence of evidence for major explosive eruptions accompanying the island’s disappearance. This is unlike Krakatau in 1883 when huge volumes of pumice were produced. There was at Ritter, in contrast, no noise, no earthquakes, no visible eruption column, no incandescence, no ashfall — apart from the ‘fine, barely perceptible rain of ash’ at Finschhafen — and no floating pumice. This apparent discrepancy was not addressed until after volcanological lessons began to be learnt from the Mount St Helens eruption in the western United States in 1980.

The northern flank of Mount St Helens had been observed bulging for many weeks prior to the disastrous eruption of 18 May 1980 when the flank gave way, creating a giant rock slide. This huge sector of the volcano quickly disintegrated into what geologists call a debris avalanche of rock, dust and air that flowed northwards into river valleys, where the avalanche changed into mudflows.

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15 Wiltgen (1979) provided sketch maps showing many pre-1888 villages bordering Dampier Strait and on Umboi Island.
17 Anonymous (1890), p. 84.
disgorging downstream. An eruption was triggered and a giant amphitheatre was formed on the volcano itself, made up of a steep back wall and two spurs that extend outwards and gradually decline in height in a roughly horseshoe-like form to the north. *Avalanche amphitheatres* of this type are different from true calderas, where the confining cliffs completely encircle the collapse depression. Geologists had described such avalanche amphitheatres well before 1980, but the Mount St Helens event triggered considerable subsequent research on their origin.18

![Figure 25. The small double escarpment at Ritter Island today is the highest part of the avalanche amphitheatre formed in 1888 and which extends out onto the sea floor to the left. The vegetated sloping area on the far right represents part of the outer slopes of the original Ritter Island.](image)

Source: E.E. Ball, 8 November 1974.

Could Ritter have produced an avalanche amphitheatre in 1888? I was able to survey the area around Ritter Island in 1985 using the commercial single-beam echo sounder of a schooner borrowed from an archaeological research project. The collapse was found to be of avalanche-amphitheatre type, rather than a caldera, and the rough features of the upper end of a debris avalanche were detected.19 Steep-sided Ritter volcano had been unstable in 1888 and had indeed collapsed, but without an accompanying explosive eruption like the one at Mount St Helens. Then, in 2004, a major marine survey used multi-beam sidescan sonar to map the extent of the submarine avalanche and its related deposits. Material from the 1888 avalanche was shown to have flowed westwards out onto the sea floor for as much as 75 kilometres from the volcano. The Ritter event was described as ‘the largest lateral collapse of an island volcano in historical time’.20

Hahl and Sapper

The German Reich by 1902 had taken over Imperial administration of the protectorate, following the failure of the New Guinea Company in Kaiser Wilhelmsland. Headquarters were now at Herbertshöhe — present-day Kokopo — immediately south-east of the volcanically active Simpsonhafen at Rabaul, near the Catholic mission at Vunapope, and close to Emma Coe’s plantation at Ralum facing majestically across St Georges Channel. Dr Albert Hahl, also in 1902, began 11 years as governor of German New Guinea based at Herbertshöhe.\(^{21}\) Hahl was trained in law and had come to the protectorate first as Imperial judge in 1896, when the New Guinea Company was still running the colony, and well after Finschhafen had been abandoned as the main administrative centre. Hahl’s career in the colony would be characterised by a paternalistic concern for the future of the Melanesians, but also by firm and at times quite brutal control of them. This reflected, at least in part, the pragmatism that Hahl was obliged to practice in response to the interests of the commercially driven planters, who required plantation labour and who had influence in the German Colonial Office in Berlin.

Hahl, in his memoirs, acknowledges the valuable geographical work that had been undertaken previously in the protectorate by both Finsch and Schleinitz, noting too the contributions to exploration made by botanist and geographer Dr Carl Lauterbach. Hahl would oversee during his own governorship an escalation in the numbers of visitors and expeditions to the region, made up of mainly German naturalists, scientists, travellers, observers and the generally curious. In particular, the extensive and well-funded scientific activity of the Hamburger Wissenschaftliche Südsee-Expedition — the Scientific South Sea Expedition of Hamburg\(^{22}\) — took place in 1908 and, in 1912–1913, the Kaiserin Augusta Fluss or Sepik River Expedition, whose members included the pioneering geomorphologist W. Behrmann.

The German navy also paid visits for oceanographic and hydrographic surveys, including the well-equipped SMS *Planet*. Its crew plumbed exceptionally deep water west of Bougainville Island. The ‘Planet Deep’ is part of the great submarine trench that runs eastwards off the south coast of New Britain and turns sharply down the south-western side of Bougainville Island. This submarine trench would be of key importance in understanding the origin of the volcanoes of both New Britain and Bougainville when the theory of plate tectonics emerged in the late 1960s. German technology was also advancing vigorously on other fronts of relevance to volcanology. Seismographs were being developed and improved, particularly by Dr Wiechert at the University of Gottingen. The Wiechert instrument would later be used for a time in Near Oceania.

\(^{21}\) Firth (1978), Sack (1980) and Hahl (1980).
\(^{22}\) See, for example, Reche (1954).
Figure 26. The volcanoes of Blanche Bay are shown on this detail from a German chart drawn from surveys after the 1878 eruption and before Rabaul town was built at the northeastern shoreline of Simpson Harbour. Water depths are in metres. The arrow indicates the site of the 1878 crater of Vulcan Island.

Source: Gazelle Halbinsel und Neu-Lauenberg published in Nachrichten über Kaiser-Wilhelmsland und den Bismarck-Archipel, 1888, 1:100,000 scale chart.
German geoscientific work of particular significance here is that of the Sapper-Friederici Expedition of 1908–1909, which surveyed throughout the Bismarck Archipelago and in the Solomon Islands. It was led by geologist and volcanologist Professor Karl Theodor Sapper and it would provide a broad context for a specific focus on the dangers of the Rabaul volcanoes. Retired captain and anthropologist G. Friederici accompanied Sapper during much of his fieldwork. Hahl himself did not make many notable observations of volcanic activity, but he is a key figure in the series of developments that eventually led the German administration to transfer its headquarters from Herbertshöhë to the shore of Simpson Harbour and so create the volcanically vulnerable town of Rabaul.

Figure 27. Karl Sapper (1866–1945) (left), from 1917, when he was on the faculty of the University of Strasburg, Germany. Sapper’s reputation continued to grow after his 1908 visit to German New Guinea and he became an established figure in international volcanology, particularly after publication of his landmark *Vulkankunde* in 1927. Albert Hahl (right), from about 1896.

Source: Sapper, supplied by V. Lorenz. Hahl, frontispiece in Hahl (1980); supplied to P. Sack and reproduced courtesy of the Hahl family.

Sapper came to German New Guinea in 1908 with volcanological expertise on the nature of explosive volcanic eruptions and their hazardous impacts.23 He was 42 years old in 1908 and had spent his early years in volcanically active Central America and southern Mexico, first with his brother helping establish coffee

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23 Termer (1966) and McBirney & Lorenz (2003).
estates there, but later developing experience through extensive fieldwork in ethnology, geography and geology, including volcanology and geomorphology. He also made a visit in 1902–1903 to Mont Pelée volcano on the small island of Martinique in the Caribbean to investigate the disastrous eruption that had recently taken place there. The town of St Pierre was overwhelmed by a searing cloud of ash, rocks and dust which had raced down the flanks of the volcano as a block-and-ash pyroclastic flow on 8 May 1902, killing about 29,000 people.

French volcanologist A. Lacroix gave the name nuée ardente, or ‘glowing cloud’, to the type of destructive cloud that destroyed St Pierre in 1902. The name is of imprecise etymology but it is now embedded in general literature, although less so today in volcanological reports. This decline in usage is because of ongoing controversies about the complex origin of pyroclastic rocks in general and uncertainty about which explosive process produces what kind of pyroclastic deposit. Careers in volcanology are built or broken on such matters. A nuée ardente is a form of pyroclastic flow — such as seen by Dampier in 1700 at Ritter — that produces block-and-ash deposits and, indeed, to a large extent the term ‘block-and-ash flow’ is now preferred. The name peléean was introduced also as a result of the 1902 eruption and applied to eruptions that produce nuée ardente types of explosive activity. But use of the term peléean has also declined, largely because pyroclastic flows can be produced by processes other that the specific one deduced for Mont Pelée in 1902. Semantic and confusing discourses of this type, however, cannot deflect in any way from recognition of the importance of the 1902 Pelée eruption in the development of volcanology during succeeding decades.

Sapper, then, had travelled widely by 1908. He had been ‘ordered’ by the Reich to go to German New Guinea in 1908, a directive that likely reflects more on his growing stature as a natural scientist who could assist in expanding the knowledge base of the colony, than on any reluctance on his part to go there. Sapper and Friederici used Herbertshöhe as a base, but much of their time was spent surveying the geology and geography of New Hanover and New Ireland, as well as the offshore volcanic islands of the Tabar-Feni group. Hahl and 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. Balbi and Bagana volcanoes were seen during the crossing. Both of these volcanoes had been observed at times in the 66 years since Parker Wilson’s observations from the Gypsy in 1842, leaving no doubt about the ongoing volcanically active nature of Bagana. Indeed, local people informed the Hahl–Sapper group that the volcano had been in eruption just two days before the

24 Sapper (1910a) assisted by C. Lauterbach.
25 Sapper (1910b) and Hahl (1980).
arrival of the European party.\textsuperscript{26} Activity at Balbi volcano, on the other hand, was restricted to water vapour emissions from the summit. Nevertheless, in 1908, the experienced Sapper was impressed by Balbi, the highest point on Bougainville Island, referring to it as a magnificent volcano and calling it a ‘complex’ made up of several cones in the summit area.

Herbertshöhe had no suitable harbour, yet a superb natural one existed at the head of Simpsonhafen within Blanche Bay to the north. Hahl, as early as 1902, had an ambition to develop a better harbour for large vessels, and so encourage expansion of commerce in, and increase exports from, the colony. He negotiated with the Bremen-based Norddeutscher Lloyd shipping line for what, for them, was basically a monopoly that cut out its Australian competitor, the Burns Philp Company. Land was acquired at Rabaul, swampy ground was drained — \textit{rabaul} means ‘the mangroves’ — and, by 1905, a pier, store and houses had been established. Thus began an inexorable shift of the colony’s capital away from Herbertshöhe to Rabaul that was well underway by 1908. There is no known record of the conversations between the governor and the professor about Rabaul, volcanoes and volcanic hazards, but there is no doubt 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 drew attention to both the clear volcanic risk that existed at Rabaul and to the ‘unpredictable’ nature of the volcanic eruptions there.\textsuperscript{27}

Engineer Ludwig Kohl in 1909 also warned of future 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.’\textsuperscript{28} Neither Sapper nor Kohl was in a position in 1908–1909 to argue that the shift to Rabaul be reversed, but Sapper did offer the following practical advice for volcanic-risk reduction:

\begin{quote}
provision 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.\textsuperscript{29}
\end{quote}

\begin{thebibliography}{9}
\bibitem{Bultitude1981} Bultitude (1981).
\bibitem{Sapper1910c} Sapper (1910c), p. 193.
\bibitem{Cilento1937} Cilento (1937), p. 39.
\bibitem{Sapper1910c} Sapper (1910c), p. 193.
\end{thebibliography}
Hahl wrote that Herbertshöhe by 1909 ‘had become a sleepy hollow’ and that he 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 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. A neat network of tree-lined streets and roads was laid out beneath and between Tovanumbatir and Rabalanakaia volcanoes, forming the basis for a tropical town that was the home of departments of German administration for agriculture and health in particular, but which included no provision for a volcanologist or volcanological observatory. This is the town that would be totally evacuated in 1937 as a result of volcanic activity, completely destroyed by Allied bombing in the Second World War while occupied by the Japanese and, after being rebuilt in the same place, largely destroyed again by further volcanic activity in 1994.

There seems to have been little concern, either, from the German authorities and from the Australian military administration that followed them in 1914, about other active volcanoes in the colony and the effects that eruptions were having on local populations. Eruptions took place at Karkar volcano in 1885 and again in 1895 when, reported a German missionary on the island, there were:

> thick clouds of smoke, often of terrible appearance … and at night the entire upper cone of the mountain is sometimes bathed in fire. A constant thundering and rolling noise reminds us of the danger we are in. So far the Lord has shown mercy. One day, when the air was heavy with ash, we expected the worst.

Pago volcano along the central New Britain coast also broke out into explosive activity in 1911, lasting until 1918. Bishop Couppé reported for 1911–1912:

> an incessant, dreadful din … and columns of smoke would be carried along by air currents and would cause terrible damage … Forests are singed and native gardens destroyed over a vast area. To escape famine the inhabitants … were forced to move to neighbouring villages or even further inland.

An elderly village leader named Boas witnessed some of the explosive activity at Pago as a child and recalled it in the 1960s, confirming the damage to gardens and lack of food, and adding that there were many explosions, but neither strong earth tremors nor fatalities.

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31 Zöller (1891).
32 Kunze (1901), p. 62.
33 Couppé (1912), p. 247.
Time Cluster of Eruptions

German natural scientists, including Karl Sapper, were voracious collectors of information in New Guinea and prolific in their production of lists and compilations, books and papers, encyclopedias and lexicons. Many of Sapper’s publications on German New Guinea are, or include, historical compilations of eruption observations. More eruptions, and more volcanoes in eruption, were reported in 1884–1914 than in any previous period in the history of Near Oceania. This, of course, is not surprising at first sight, given the presence of an increasingly large number of literate observers over the 30 years of German colonial rule.

The 1888 collapse of Ritter was the most disastrous volcanic event of the German period. Manam had by far the largest number of recorded eruptions, and Bam, Karkar, Langila, Pago, Ulawun, and Bagana volcanoes were all in explosive eruption. More significantly, however, eruptions took place at another four volcanoes — Bamus, Lolobau, Makalia, and Victory — none of which has been active in the more than 90 years since German times. These four volcanoes are today shrouded in vegetation and appear ‘extinct’ to the casual observer. There is a dearth of written observations by eyewitnesses of the eruptive activity at the four volcanoes, and knowledge of the eruptions comes from observations made of the appearance of the volcanoes shortly after the activity or from oral history supplied by local people.

The number of volcanoes active during the narrower period of 1884–1899 — the first 16 years of German control — is especially striking. There were possibly as many as nine volcanoes in eruption, including three of the four that have not been in eruption since that time. Why should so many volcanoes have been active in the late nineteenth century? Should these eruptions be dismissed simply as an artifact of reporting intensity? Or do they represent another time cluster or ‘pulse’ of eruptive activity, like the one suspected for the mid- to late 1870s and, more particularly, like those that would be well documented in the mid-1950s and early to mid-1970s?

Hahl left Rabaul early in 1914, never to return. The First World War broke out later that year and, in September, the Australians, with instructions from the British, sent from the south a large expeditionary force and invaded German New Guinea. The Reich had long recognised that their tiny colony — half a world away from Berlin — would be strategically and militarily unimportant in any major war centred on Europe, and so made virtually no preparations for

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35 See also, for example, Hammer (1907).
36 Several German reports refer to previous eruptions from Lolobau Island in 1904–1908 and possibly 1912.
its defence. Germany lost a small jewel in its imperial crown — a useful status symbol on the stage of international politics but ultimately a limited colony of no great economic or strategic value to them.

Table 2. Volcanoes in Eruption in Near Oceania from 1884 to 1899

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<th>Volcano</th>
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<td>Ulawun</td>
<td>1898</td>
<td>An eruption was seen from 210 kilometres away, and eruption devastation — probably caused by pyroclastic flows — on the volcano, was observed the following year.a</td>
</tr>
<tr>
<td>Bamus*</td>
<td>1894</td>
<td>Descriptions of the volcano in 1894 are consistent with an eruption having taken place sometime during the previous several years.b</td>
</tr>
<tr>
<td>Makalia*</td>
<td></td>
<td>Information collected in 1963 from villagers at the northern end of Willaumez Peninsula refers to an eruption from nearby Makalia volcano, within Dakataua Caldera, that must have taken place in about 1880–1890.c</td>
</tr>
<tr>
<td>Langila</td>
<td>1884–1890</td>
<td>Eruptive activity is known from a few short reports.d</td>
</tr>
<tr>
<td>Ritter</td>
<td>1888</td>
<td>Evidence for eruption of new magma at the time of the cone collapse has not been found, but intrusion of magma into the volcano is one of the possible triggering mechanisms for the collapse.</td>
</tr>
<tr>
<td>Karkar</td>
<td>1885, 1895</td>
<td>Explosive eruptions were reported briefly by missionaries.e</td>
</tr>
<tr>
<td>Manam</td>
<td>1885–1899</td>
<td>Several observers recorded eruptions.f</td>
</tr>
<tr>
<td>Victory*</td>
<td></td>
<td>A series of observations of the mountain, in British New Guinea, in the late nineteenth century is consistent with eruptive activity having taken place sometime in the late 1880s.g</td>
</tr>
<tr>
<td>Bagana</td>
<td>1884–1899</td>
<td>The volcano was identified in 1884 as ‘active’, but unequivocal explosive eruptions were not recorded until 1894–1899.h</td>
</tr>
</tbody>
</table>

Note that Tuluman volcano can be added to this list if the range is expanded to 1883–99 and if its reported eruption of 1883 is a correct identification.

a. Parkinson (1999; originally published in German in 1907).
b. Couppé (1896).
c. Branch (1967).
e. McKee et al. (1976).
g. See, for example, Macgregor (1890–1891).

* The asterisks refer to volcanoes that have not been in eruption since the late nineteenth century.

The Germans’ 30 years in New Guinea were, without question, scientifically successful. German scientists did not, however, venture far into the interior of the New Guinea mainland, except on voyages up the Sepik and Ramu rivers, so they had no knowledge of either the volcanoes or the tens of thousands of Melanesians in the highlands region of New Guinea south of the Sepik and Ramu. Also, and more particularly, German authorities seem to have held no
special concern about volcanic eruptions from coastal volcanoes that might impact seriously on their investment and lives, and on the lives of Melanesians. This was notwithstanding both the Ritter disaster of 1888 and Sapper’s poignant warnings about Rabaul’s volcanic risk.

Figure 28. A Roman Catholic brother made this sketch of Bamus during the voyage made by Bishop Couppé in 1894. Couppé wrote that ‘During a recent particularly severe eruption the fiery flow of lava [probably a block-and-ash flow] went beyond the foot of the mountain and ran into the valley [between Bamus and Ulawun] causing great damage … the formerly majestic trees on its banks are left upright but dead and dried up’ (1896, p.119).

Source: Couppé (1896; the drawing is on p. 150 of the issue containing Couppé’s paper).

References


