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NOTES ON RITTER, SAKAR, UMBOI AND LONG ISLAND VOLCANOES

by

O.A. Taylor.

The Ritter, Sakar, Umboi, and Long Islands form part of an arc of volcanic islands situated West of New Britain. A brief inspection of this group was carried out by J.G. Best and the writer in August 1952 following a period spent in observation of abnormal conditions at Mount Langla Volcano on Western New Britain.

RITTER ISLAND.

Ritter island or Kulkul, as the natives call it, lies roughly midway between Sakar and Umboi islands. The island represents a remnant of a volcanic cone which was destroyed by an eruption in 1888 and is a narrow ridge approximately 400 feet high. The ridge was originally the north eastern section of the cone. The rocky slopes of the island are covered by a scant vegetation of pandanus, small saplings and grasses.

Previous Activity

The first reference to activity of Ritter Island is found in Dampier's "A Voyage to New Holland". On 25th March 1700 Dampier noted:-

> "The island all night vomited fire and smoke very amazingly; at every belch we heard a dreadful noise like thunder, and saw a flame of fire after it, the most terrifying that ever I saw. The intervals between its belches, were about half a minute, some more, others less: neither were these pulses or eruptions alike; for some were but faint convulsions, in comparison of the more vigorous; yet even the weakest vented a great deal of fire; but the largest made a roaring noise, and sent up a large flame 20 or 30 yards high; and then might be seen a great stream of fire running down to the foot of the island, even to the shore. From the furrows made by this descending fire, we could in the day time see great smokes arise, which probably were made by the sulphurous matter thrown out of the funnel at the top, which tumbling down to the bottom, and there lying in a heap, burned till either consumed or extinguished; and as long as it burned it kept its heat, so long the smoke ascended from it, which we perceived to increase or decrease, according to the quantity of matter discharged from the funnel".

Reports indicate that between 1827 and 1885 this volcano was inactive. The cone was 2600 feet in height, resembling Bairak on Umboi in its proportions. According to a native on Sakar island who survived the 1888 eruption, the island was covered with vegetation and was occasionally visited by fishing parties. No one lived there permanently. In 1887 the volcano was reported as active and on 13th March 1888 explosive activity began around 4 a.m. following numerous earthquakes which were felt on Sakar and New Britain. Shortly after dawn most of the island was disintegrated by a violent explosion. Tidal waves from this outburst wiped out coastal villages within a radius of 70 miles. The nearby coasts of New Britain, Sakar, and Umboi were worst affected. The sea swept to ½ mile inland and the wave was 40 feet high on New Britain, 30 feet on the Maclay Coast, and up to 7 feet at places as distant as Salamaua and Blanche Bay.

The initial wave at Kalingi was preceded by an ebb of the sea which revealed all the fringing reefs and prevented the

fishing canoes from reentering the lagoon. The first wave swept these craft over the reef and into the forest beyond the shore line. Some natives saved themselves as they passed beneath large trees by clambering up hanging vines. There were two major waves associated with this disturbance of the sea, and an ebb and flow which lasted two hours after the initial wave.

All activity apparently ceased after this disastrous outburst.

The present remnant of the original cone is composed of beds of coarse vesicular scoria and flow rocks buttressed by a complex system of concordant and discordant dykes. The lava of Ritter is grey to brown in colour and appears to be intermediate in composition. Its chief peculiarity is a type of "pudding-stone" texture produced by the presence of numerous green augite phenocrysts of up to 1 cm in diameter.

Recent talus aprons of collapsed material are a feature of the steep inner face of the cone and dust clouds sent up by landslides and falls of rock are identified by the Kumbalap natives of Umboi as "smoke" rising from Kulkul. As the falls are frequently initiated by earthquakes they are naturally associated with volcanic activity by the natives.

The inspection of the island failed to reveal any signs of recent volcanic activity.

SAKAR

Sakar island is a relatively symmetrical volcanic cone 3275 feet in height. The summit is capped by cloud over long periods. The small summit crater shows no signs of activity, according to reports from local natives. The only hot area on the island is where a series of springs emerge from beneath vesicular basaltic flows on the southern coast of the island about 3 miles east of the village Alaro.. The flows appear to be relatively basic in composition and contain phenocrysts of labradorite. Older lava flows are present on the coast midway between the hot springs and Alaro village. These older flows show the curious "pudding-stone" texture of the Ritter lavas, with similar large phenocrysts of green augite.

There is no record of an eruption from this centre. The thick vegetation cover on the slopes and the relatively deep valley dissection suggests that many centuries have elapsed since the last eruption.

UMBOI ISLAND

Umboi island was visited to check on the report from the Kumbalap natives that activity had been seen on Ritter island. The coastal area between Kabib and Kumbalap was examined.

Although there is no recorded eruption on Umboi, the evidence of the fairly well-preserved cones on the northern side of the island suggests that there has been relatively recent activity in this area. Solfataras are reported from near Awelkom mission station and in the central part of the island.

West of the Kabib anchorage a grass-covered dome-shaped hill proved to be built up from coarse lapilli containing large crystals of green augite.

About a mile east of Kabib the track passes along the rim of a crater lake. An inconspicuous ash cone of non-vesicular material suggests that the crater was formed by a single steam explosion. The rim of the crater is roughly circular, 400-500 yds in diameter and about 200 feet above the level of the lake.

Representative samples of the lavas were collected along the coast between Kabib and Kumbalap; Pumice is completely absent

in this area and vesicular lavas are not common. The most common lava type is a dark-grey rock with abundant felspar.

The Kumbalap natives stated that white smoke had been seen rising from Ritter Island after an earthquake during the North West season, in October 1951. This phenomenon was caused by landslides as mentioned in the section on Ritter island.

LONG ISLAND (AROP)

Long Island appears to be a broad truncated cone and is the most westerly of the islands examined. It is approximately 19 miles long and 12 miles wide; the long axis trends south-east. The centre is occupied by a crater or caldera lake, eight miles long and more than six miles wide. The general level of the caldera rim is more than 1000 feet above sea level and two of the parasitic cones on the flanks rise to more than 3500 feet: the highest, Mt. Reamur in the north section of the island, is 4278 feet.

There is no record of an eruption from Long Island. An active cone in the southern section of the lake was reported during the war.

The Crater

Access to the crater was gained by following a native hunting track which begins at the mouth of a stream called the Arabusungna. The mouth of the stream is about two miles south of the village of Malala on the east coast of the island. A quarter of a mile from the beach, the track ascends a ridge on the left side of the valley. The rim of the caldera is about an hour and half's walk up a gentle forest covered slope of the volcano. Vertical cliff faces and embayments in the indented rim of the caldera hide all except the northern part of the lake from the point where the track reaches the edge of the caldera.

The lake level is approximately six hundred feet below the rim of the caldera at this point. A raft was constructed from driftwood on the lake shore and paddled out beyond the arms of surrounding embayments to gain a view of the southern end of the lake. The active cone; which was evident in this southern section during the war when the lake was photographed, could not be located. It has either subsided in the lake or has such a small elevation above water level that it is not visible at a distance of 5 or 6 miles. Checks showed that the lake was more than 200 ft. deep at a distance of 400 yards from the shore.

The water of the lake was brackish but potable. Waterfowl were abundant but no fish were seen. According to native reports, external drainage of the lake began less than 15 years ago, by a stream entering the sea about four miles south of Malala. As the caldera rim reaches its lowest point (700 ft. approx.) in this vicinity the observation is probably correct.

The crater wall consists of layers of lapilli and fine ash. Approximately 200 feet above lake level are numerous boulders of felspathic pitchstone. The ash and lapilli layers dip steeply in to the crater at lake level. The gravel on the shore contains numerous hardened pisolites.

Evidence of Recent Eruption

On the upper part of the cone slope isolated residuals of the original cone crust, composed of a coherent mixture of volcanic sand and dust, occur. The existence of this material which was presumably deposited during the last eruption, suggests an outburst of comparatively recent origin. Some support may be given to this view by the apparent youthfulness of the forest cover. No large trees were seen on the slopes of the mountain; but this could be due to an inhibitory factor in the soil structure, for the soil on the slopes is so porous that the natives usually grow their taro beside the small streams, and in some localities

along the coast the forest is replaced by savannah woodland or a heath which is quite foreign to the climatic environment of the island.

More conclusive evidence suggesting a comparatively recent eruption was found in a study of the wave-cut cliff sections along the east coast of the island from Pt. Kiau to a point midway between the villages of Malala and Bok. These sections consist for the most part of a homogeneous layer of fresh ash which appears to be the product of a single recent eruption. The ash is predominantly formed of lapilli and consists of a variety of lava types. A small amount of pea-sized pumice is present. The most common constituent is a pitchstone and black lava containing large phenocrysts of felspar. The sections vary from 20 to 30 feet in thickness and in one place along the Arabusungna over 100 feet of homogeneous ash is exposed.

A basal section is revealed in a cliff face at the end of a blunt peninsula about three hours' walk south of Malala and immediately south of a stream called Iabigipoonoo. At the base of the section are three feet of black to dark chocolate-coloured tuff which contains numerous plant fossils and imprints left by standing trees. Above this horizon are three to four feet of reddish-yellow unfossiliferous pisolitic tuff with a well-defined platy fracture. Above this is 9 to 12 inches of curious "metallic" lapilli the particles of which have a dull metallic silver and gold lustre, a reddish pisolitic tuff, and a chocolate tuff which contains marine fossils.

Material derived from the last eruption disconformably overlies the chocolate tuff. A lapilliform layer, 6 to 12 inches in thickness, which consists mostly of sharply angular fragments of a fresh felspathic pitchstone of a size rarely greater than 1 inch in diameter, forms the base of the recent material. Mixed with these lapilli are fragments of charred wood and in some places completely carbonised tree trunks. The 20 to 30 feet of overlying ash contains odd boulders up to a foot in diameter but consists for the most part of a dark lapilli and sand, as has been described above.

The character of these deposits suggests a spasmodic and highly explosive pattern of activity. The basal chocolate tuffs were deposited on a well-vegetated land surface presumably after a long period of dormancy. Violent explosive activity occurred in two separate phases of considerable duration. The later phase was the more powerful, involving an ejection of molten material during its medial period. Subsidence of the coast followed this outburst and a protracted period of dormancy ensued.

The final event was a catastrophic eruption of great magnitude, completely covering the island with heavy deposits of ash and in all probability removing the central cone by explosive violence or secondary subsidence. The fact that the initial deposit of angular lapilli contained well-disseminated charred wood fragments argues against deposition in water, in spite of the fact that the underlying beds contain numerous marine fossils. It is probable that severe seismic disturbances preceded the eruption and these were accompanied by uplift of the coastline; a not uncommon prelude to violent outbursts.

Population

Recent investigation by A.D.O. Parish suggests that the eruption was of comparatively recent origin as stories of the escape from Arop are still current among natives of the surrounding islands. It seems evident that some very alarming warning phenomena preceded this eruption as a considerable number of natives appear to have escaped from the island before the catastrophic eruption took place.

Mr. Parish believes that the Siassi island people originally come from Long Island, and has found, on the harsher parts of the

neighbouring New Guinea coast, settlements of natives who are also evacuees. One group, he believes, settled near Lutheran Anchorage on northern Umboi but were subsequently wiped out by the 1888 eruption of Ritter Island.

Long Island was still uninhabited in 1921. Seven years later the movement of Tolekewa natives had begun and today there are more than 300 Tolekewas and their descendants on the island. The majority of them live at Malala and Bok on the east coast. A small breakaway village has started at Point Kiau.

G.A. Taylor.