

VOLCANIC ACTIVITY

LAKE WISDOM, LONG ISLAND, T.N.G. MAY, 1953.

by

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RECORDS 1955/98.

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INTRODUCTION

A report of apparent volcanic activity in the vicinity of Long Island was received by the writer from Rev. Knoller of the Lutheran Mission, Unboi Inland at approximately 1400 hours, 9th May, 1953. Approximately one hour later, Captain I. Taylor of Qantas Empire Airways, flying between Rabaul and Madang, was requested to observe Long Island and check this report. Confirmation of this report was received by the writer at Rabaul from Capt. Taylor at 0630 hours Sunday, 10th May, 1953. Capt. Taylor also advised the District Commissioner at Madang (Mr. C. Bates) who reported to the Government Secretary at Port Moresby on Sunday, 10th May, 1953.

Capt. Taylor's report described a small island approximately ten feet high near the centre of Lake Wisdom, from which jets of "mud" and steam were being expelled at roughly ten minute intervals.

On Sunday morning, 10th May, the District Commissioner, Madang, accompanied Capt. Taylor on another inspection and reported slightly less activity than observed the previous day.

The acting/Director, Department of District Services and Native Affairs, and the Senior Geologist, arrived in Madang at 0900 hours on Monday, 11th May, per charter Catalina from Port Moresby. The District Commissioner, Madang, boarded the aircraft and the party proceeded to Long Island, arriving there at 1030 hours. Despite poor visibility, steam clouds were observed near the centre of Lake Wisdom from a distance of about 7 miles. These clouds mingled with the general cloud cover at 2000 feet. Closer inspection revealed that minor explosions were ejecting narrow columns of black, fragmentary material (Lapilli) to a height of 300 feet. These explosions at the time of observation were almost continuous and the ejections both vertical and oblique. Larger ejectamenta were in many cases accompanied by vapour trails. Neither the shape nor the true dimensions of the island could be discerned because of low lying steam clouds. From intermittent observations, the height of accumulated black lapilli was estimated at 40 feet at the south eastern end and extending north west for at least 200 feet. The activity was observed for twenty minutes and an inspection of the lake and lake walls revealed no other abnormal conditions. The party returned to Madang at 1230 hours and a report of the above observations was radioed to the Government Secretary, Port Moresby, and it was recommended that evacuation already initiated by the District Commissioner, Madang, be continued.

Due to adverse weather conditions, the writer did not reach Madang until 1700 hours on May 11th, 1953. At 0730 hours the following day, he accompanied the previous day's inspection party to Long Island. Observing conditions were again adverse and steam clouds were not sighted until within 10 miles of the centre of activity. Observations from a low level permitted more detailed study of the activity than was possible on previous occasions. It was not possible accurately to determine the position of the new crater, but it appears to correspond with that of the active crater shown on Military Sheet, 1 inch = 1 mile (1943) of Long and Crown Island. The island was notably higher than on the previous day, with a maximum height estimated at 100 feet. It appeared to be crescentic, with the crater disposed towards the south east. The crater rim appeared to be entirely above water level. In

contrast with almost continuous minor explosions of the previous day, larger explosions were ejecting greater volumes of ash and lapilli etc. at intervals varying from 15 to 30 seconds. These explosions were accompanied by correspondingly larger steam clouds. A further circuit of the lake again revealed no other abnormal conditions.

PREVIOUS INVESTIGATIONS

Long Island was visited by Mr. G.A. Taylor, Volcanologist, and the writer in August, 1952. They remained in the area for four days, during which time they examined cliff sections along the eastern coast and visited the eastern side of Lake Wisdom. The active crater indicated on the Military Sheet previously referred to, was not apparent. Recent geological history as interpreted during this survey from cliff sections on the eastern side of the island indicate a previous violent eruption. Native legends contain reference to such an eruption probably several hundred years ago.

A full account of this survey is contained in Taylor's "Notes on Ritter, Sakar, Umboi and Long Islands".

RECENT OBSERVATIONS

The initial report of renewed activity describes "smoke arising ... vicinity Long Island". However, the exact location from which this observation was made is unknown.

The appended table summarises significant features of the recent aerial observations.

Throughout the period of observation no wave action attributable to seismic activity has been noted on the lake.

INFERENCE

The above features are indicative of the early phase of a minor Vulcanian type eruption. It is obvious that there is a progressive increase in activity to date.

Vulcanian-type Eruptions are characterised by ejection of vast clouds of dark-coloured fragmentary material accompanied by considerable quantities of gas. Cone building under these conditions can be rapid; for example, Vulcan, Blanche Bay, New Britain 1937, built up a cone from sea level to 750 feet in three days. Gases are predominately steam, and hot, but not incandescent fragmental material.

LAKE WISDOM occupies the central portion of the island filling a caldera which it is presumed was formed in the vast eruption abundant evidence of which is visible in the cliff sections previously referred to. The Lake is approximately 28 square miles in area and the water level is maintained at about 500 feet above sea level. The cliffs encircling the lake, with the exception of one portion on the eastern side have an average elevation of 1000 feet above sea level. The low gap on the eastern side is estimated to be about 150 feet above lake level. Further considerable development within the caldera may lead to partial evacuation of the lake waters through this gap.

RECOMMENDATIONS

Present evidence suggests that this may be a small localised eruption, similar to that which gave rise to the active crater as shown on Military Sheet previously referred to. However, there remains the possibility that this activity may precede general reactivation of the caldera, although the present lack of any accompanying seismic activity does not support this. Reactivation of the caldera could culminate in a major eruption such as that recorded in the cliff sections. Precedents in other parts of the world which have culminated in major eruption have developed

with growing visible signs accompanied by increasing seismic activity over several months. In view of the brief period of observation and the apparently long period of relative quiescence, it is advisable to remove the small population, initially for a period of one month, to the mainland. During this period of evacuation it is further recommended that all pilots of aircraft flying in the vicinity to be requested to report on conditions prevailing at the active centre. Such reports to be made to Air Radio whilst planes are in the vicinity of Long Island. These reports should be relayed to the Volcanologist at Rabaul and the Government Secretary, at Port Moresby. Should any spectacular increase in activity be reported, the writer will return for further observations. Failing such reports, the area should be inspected in one month's time.

FEATURES TO BE NOTED BY PILOTS

1. Dimensions of new crater
2. Frequency of explosion
3. Height and colour of ejected material
4. Condition of lake surface
5. Evidence of recent landslide activity on caldera wall.

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APPENDIX

DATE	OBSERVER	Approx. Height of Crater	Frequency of Explosions	Nature of Ejections	Ejectamenta	Steam	Other Phenomena
9.5.53	Taylor	10 ft.	10 minute intervals	Vertical jets	"Mud"	Billowing clouds	Vent below water level
10.5.53	Taylor Bates	10 ft.	Indeterminate but infrequent	Narrow columns at varying angles	Ash, Lapilli	Less than above	As above
11.5.53	Bates Thompson Roberts Oakley	40 ft.	Continuous	Narrow columns at varying angles	Ash, Lapilli	comparable with 9.5.53	Vent at water level
12.5.53	Bates Thompson Roberts Oakley Best	100 ft.	Intermittent, 15 to 30 sec. intervals	Broad column of ejectamenta mainly falling back into crater.	Ash, Lapilli	Increasing	Vent above water level.