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PRELIMINARY REPORT ON INVESTIGATION VOLCANIC ACTIVITY UMBOI ISLAND, NEW GUINEA.

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PRELIMINARY REPORT ON INVESTIGATION

VOLCANIC ACTIVITY UMBOI ISLAND,

NEW GUINEA.

1. Location and Physiography:

Umboi or Rooke Island lies between the western end of New Britain and the New Guinea Mainland. It is flanked on the western side by Vitiaz Strait and on the eastern side by Dampier Strait. It is the largest island of a group known as the Siassis and is approximately thirty-two miles long and eighteen miles wide. It is somewhat ovate in shape (the major axis being oriented approximately North 30 West) and is practically entirely volcanic in origin.

Approximately seventy to eighty percent of the island consists of rugged broken country containing a number of well preserved volcanic cones. Maximum elevation is attained at Mt. Bell (elevation approximately 5,000 feet). A peripheral zone of low swampy ground skirts the southern flank of Mt. Bell and constitutes the southern portion of the island.

2. Previous Reports and Investigations:

During August 1952 whilst making a brief survey of volcanic areas in the Siassi group, the writer in the company of Mr. G. A. Taylor visited Gizarum Plantation, Umboi. Enquiry revealed that only one thermally active area was known - a series of hot water springs in the vicinity of Awelkon.

On 10th October a severe earth tremor shook the island and numerous after shocks continued for some days. (Reference: "Seismic Activity on Umboi Island" - G. A. Taylor).

Early in November Mr. Taylor and the writer again visited the island. Tiltmeter readings were made at Gizarum and Lablab. (Reference Appendix II Mt. Langla Volcano Report 1952/80 - G. A. Taylor).

Upon Mr. Taylor's return to Port Moresby a statement made by him reference activity at Mt. Langla, New Britain, and Umboi Island was misconstrued and resulted in the erroneous assumption that a volcanic eruption at Umboi was expected in March, 1953.

Subsequently an evacuation of certain parts of the island was ordered. (Reference: "Reports of Seismic Activity on Umboi Island" - A. A. Roberts, A/Director, Department of District Services and Native Affairs, 34-3-1 18th November, 1952).

At the end of November the District Commissioner, Morobe District, visited Umboi Island and appointed an emergency council composed of four Europeans and four natives to supervise any emergency evacuation which may become necessary. In addition the natives were advised to prepare houses and gardens in the vicinity of the coast as a refuge in the event of an eruption occurring.

(Reference: "Seismic Activity on Umboi Island - H. L. R. Niall, District Commissioner, Morobe).

On the 9th January, 1953, the writer received a letter from the Rev. Knoller of the Lutheran Mission, Umboi, describing some recently discovered thermal areas.

Permission was requested and obtained from the Government Secretary, Port Moresby, to proceed to Umboi and investigate these areas.

3. Latest Investigation:

The relative inaccessibility of Umboi Island plus the fact that the writer had to be back in Rabaul before the 9th of February, combined to restrict the length of time available for the investigation.

The writer departed Rabaul per Administration trawler "Theresa Mae" at 0830 hours on Friday, 23rd January, and arrived at Gizarum on Tuesday, 27th January, at 1030 hours. Five days were spent in the area; the writer departed Gizarum at 1030 hours Sunday, February 1st, and arrived in Rabaul on Thursday, 5th February, at 1100 hours.

During the investigation all six thermal areas known to the inhabitants, both European and Native, were visited.

These six areas are disposed about Mt. Talo, a well defined volcanic cone containing two crater lakes and located somewhat northwest of the centre of the island. (Grid Reference: Sag Sag 1:253,440 - 899281). These thermal areas have been numbered from i to vi in the order in which they were visited.

(i) Thermal Areas: Location: Approximately 30 minutes walk from Awelkon Mission Hospital - half a mile upstream (east) of the Awelkon-Ovangai crossing of the Kupuk River. (Grid Reference: Sag Sag 1:253,440 - 896227). (Note - Location of all thermal areas is an approximation only as time did not permit a correct determination of their location).

Type: Small hot spring emptying into west side of Kupuk River at base of a waterfall, approximately 15 feet high. Temperature 42° Centigrade, water clear, no odour.

The temperature of the water of the Kupuk at the Awelkon-Ovangai crossing is 35° Centigrade.

The Rev. Knoller stated that there were several of these hot springs further up the stream, they were not visited.

(ii) Location: Approximately half an hour's walk northwest of Tarawe Village. (Grid Reference: Sag Sag 1:253,440 - 898277).

Type: Flat barren elongated depression, approximately 200 yards long and 80-90 yards wide. The depression occupies portion of a wide drainage channel and is evidently an old solfataric area. A few outcrops of kaolinised lava occur surrounded by silt and detrital material. A small flow of warm water was welling up in the northeast corner at the time of the visit - temperature 39° Centigrade - odourless.

The native name for the area is Tupong and has been known for a considerable period of time.

(iii) Location: Approximately three hours walk from Awelkon. (Grid Reference: 812278, area lies on the Southeast flank of a parasitic cone, southeast of Mt. Talo.)

Type: Numerous bubbling mud pools occupying an area approximately 100 yards long and 30 yards wide. Area drained by a cold water creek. Approximately 30 yards from and 100 feet above main area - Azimuth 298° - there are two very viscous bubbling mud ppols surrounded by thick vegetation. Maximum temperature recorded in both localities 98° Centigrade. The existence of this area has been known to the native peoples for a considerable period. It is obviously old and its stability is testified to by the presence of thick vegetation closely flanking the thermal vents.

Further evidence of thermal activity occurs some 250 yards down stream. Here an old solfataric area flanks the stream for approximately 15-20 yards along the south-west bank.

This area although quite close to the major area was only recently discovered during an investigation in December by the Rev. Knoller and Mr. Thamm of the Lutheran Mission. Its age and decreased activity is evidenced by the degree of decay of the outcropping rocks and the remnants of former small sulphur deposits. A faint smell of H_2S was detected and a maximum temperature of 98° Centigrade was recorded.

A minor structure of interest was noted here: a small spatter cone approximately nine inches in diameter and height, composed of mud was in the process of being built up by an obliquely inclined vent developed in the deeply weathered bank above the stream. The vent was discharging steam (temperature 98° Centigrade) and occasional blebs of viscous mud. A lighted cigarette or match thrust into the vent caused an apparent increase in the emission of steam. It is probable that the introduction of the hot object caused increased condensation of the vapour issuing and thus an apparent increase in the volume of steam emitted.

Some recent minor landslide activity in this area is considered to be a result of normal weathering processes and not of any volcanic significance.

(iv) Location: Approximately two hours walk north-east of Awelkon. (Grid Reference: 899280).

Type: This area is high up on the southern flank of Mt. Talo and consists mainly of decadent solfataric areas of limited extent and several lava blowholes emitting steam.

The largest area was the first visited and runs for about 15 yards along both sides of a steep narrow creek bed. Steam with a faint smell of H_2S was seeping out through numerous vents in the deeply weathered volcanic breccia. Maximum temperature recorded was 94° Centigrade.

Above this area in the same creek was noted another area of limited extent, it was not visited, due to difficulty of access.

In the adjacent creek to the northwest and still higher up another small decadent solfataric area was visited. H_2S was not detected here and the maximum temperature recorded was 88° Centigrade.

Two small lava blowholes emitting steam at 90° Centigrade and 62° Centigrade, respectively, were encountered

a little further up this creek. Increased fuming was again noted upon the introduction of a lighted cigarette.

(v) Location: Approximately one hour and a quarter's walk south of Mararamu Village. (Grid reference 899283).

Type: This area, denuded of vegetation, outcrops along both sides of a small creek for approximately 20 yards. Total width of outcrop approximately ten yards. This area is flanked by comparatively open timbered country with practically no undergrowth. A most unpleasant odour pervades the area (possibly very impure H_2S) and the presence of kaolinised lava and remnants of small sulphur deposits indicate its solfataric origin. No temperature points were discovered in this area.

(vi) Location: Approximately two hours walk north-east of Barang Village (Grid reference: 897281).

Type: This area consists mainly of bubbling mud pools disposed along creek courses over a somewhat extensive area. In all, five groups were visited and the maximum temperature recorded was 98° Centigrade. The majority of these thermal pools have been know to the natives for a considerable period of time, however, two more were discovered during the course of the investigation.

Crater Lake: The western crater lake at the crest of Mt. Talo was visited. Recent landslide activity was evident on the northern wall of the crater, however, it is not considered to be of volcanic significance. No evidence of thermal activity was evident within the crater which is heavily timbered down to the waterline.

Rock Types: All rock types encountered during the investigation are of volcanic origin. Old, deeply weathered lava flows are numerous and extensive, and the rocks constituting them are dark in colour, basic and predominantly porphyritic. Gradations from vesicular to massive occur. An extensive area of volcanic breccia outcrops in the vicinity of No. (iv) thermal area, and a thin bed of decomposed pumice was noted in a road cutting near the wharf at Gizarum.

This rock assemblage suggests that any future eruptive activity in this area would be Vulcanian father than Pelean.

4. Summary and Conclusions:

The unfortunate misinterpretation of a statement made by Mr. G. A. Taylor on his return from Umboi Island in November, was beneficial, in that it made the inhabitants of the area, both European and Native, "volcano conscious" and resulted in the areas previously briefly described, being brought to notice.

In a rugged area, such as Umboi, it would be a long and arduous task for a European to endeavour to locate all thermal areas, however, with natives made aware of the significance of such places and familiar with the terrain through numerous hunting excursions, the location of all such areas should be fairly rapidly attained. Admittedly, in the recent past, two areas previously unknown to the natives, have been discovered. However, it is reasonable to assume that whilst all thermal areas may not have been visited, at least representative samples, were.

It is significant that all the areas visited are disposed more or less symmetrically about Mt. Talo, a volcanic cone occupying approximately a central position in the volcanic complex that constitutes the greater portion of Umboi Island.

It has been observed elsewhere that when a volcanic area reaches a decadent stage, the active centre becomes restricted to more or less the central portion of that area. This appears to be the case at Umboi. With this factor in mind the natives were questioned as to the presence of thermal areas in the vicinity of any of the other volcanic cones in the northern or southern portion of the island. Whilst a negative answer does not prove their absence, the absence of any knowledge of any other thermal areas does appear to indicate that thermal activity is confined to the environs of Mt. Talo.

All the areas visited were most obviously decadent solfataric areas and showed no evidence of a recent recrudescence of activity.

Thus the writer is of the opinion that the possibility of an imminent eruption occurring on Umboi island is remote.

However, the presence of well defined cone structures on the island and in particular, the presence of thermal areas about Mt. Talo do indicate that volcanic activity in this area is not yet extinct.

Whilst the writer was in the area a native police constable arrived from Finschhafen and proceeded on a tour of inspection of the alternative housing and garden sites. Natives stated that he advised all people except Luluais and Tultuls to move to these sites. This instruction was at variance with that last issued by the District Commissioner Morobe District. Unfortunately, the writer was unable to contact this police boy to check the veracity of this statement.

During the investigation the writer was accompanied by a number of natives including the officials of Tarawe, Muraramu, Gom and Arot, appointed to the emergency Council by the District Commissioner, Morobe District. At the end of the investigation these natives were desirous of knowing the significance of the areas visited. They were informed that it was considered that there was little cause for concern as things are at present. The question was then raised as to the advisability of returning to their original village sites. To which the writer replied that under existing conditions there appeared to be no reason why the original village sites should not be re-occupied but that no such action was to be taken until instructed to do so by an officer of the District Services staff.

5. <u>Recommendations</u>:

(a) That a further and more extensive examination be made of all areas visited in about six months time, preferably by the writer, as a fairly accurate comparison should then be able to be made and a trend, if any, detected.

(b) The natives have been requested to open tracks to the thermal areas visited and it is recommended that this be supervised by the Department of District Services and Native Affairs Officers to facilitate access as most areas lie off the beaten tracks.

(c) The natives to be encouraged during their hunting excursions to be on the lookout for other thermal areas and to report same to the Lutheran Mission staff.

(d) The natives be allowed to return to their original village sites as these areas appear to be healthier than those at present occupied on the coast and the present occupied on the coast and the present volcanic situation is not considered to constitute a danger.

6. Acknowledgments:

In conclusion the writer wishes to express his appreciation of the help and hospitality afforded him by the members of the Lutheran Mission. Mr. F. Thamm of the Gizarum plantation staff was particularly helpful and accompanied the writer during the first two days of the investigation.

The help supplied and interest shown by members of the native population was particularly gratifying when contrasted with the lack of co-operation and antipathy encountered in the Kalingi area.

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