

LONG ISLAND, PAPUA NEW GUINEA  
ASPECTS OF LANDFORMS AND TEPHROSTRATIGRAPHY

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SUMMARY

Present day geomorphic processes on Long Island include rapid trimming of the coastline and caldera wall by wave action. Deep, rapidly eroding linear gullies cut in the youngest pyroclastic deposits expose numerous sections which allow reconstructions of the island's recent eruptive history.

Deposits from three major Plinian and Peléan pyroclastic eruptions dated at approximately 16,000, 4,000 and 200-300 radiocarbon years bp have been recognised. These phases of cataclysmic activity, probably with associated caldera collapse, were separated by numerous intermittent tephra falls many of which would have been heavy enough to destroy much of the physical environment of the island. Interpretation of the pyroclastic deposits erupted during the period of human occupation provide information about changes in the physical environment.

INTRODUCTION

Although investigations of the volcanology of Long Island extend back to the early 1950's, attention has been focused almost entirely on present activity and petrology to the neglect of the geomorphology and the widespread tephra mantles. The investigations outlined here indicate that the tephrostratigraphy provides the key to the recent history of the central part of the island including the caldera, Lake Wisdom.

Field examination by the three authors was concentrated on the western and northern parts of Long Island. Twenty-four exposures of tephra layers were recorded in some detail and more cursory examinations were made at numerous other sites. These observations together with air photo interpretation indicate that the principal events in the evolution of the present topography of Long Island include the early development of a central volcano, the growth of major and minor satellite eruptive centres, and the occurrence of recent major eruptions which resulted in the formation of the large central caldera and the deposition of extensive and thick pyroclastic deposits. The most important elements of the geomorphology of the island are those relating to the recent phases of major eruption and caldera collapse.

In the present paper significant aspects of the island's geomorphology and the stratigraphy of the pyroclastic deposits emplaced in the Late Quaternary are described and discussed and used to provide some information about aspects of the physical environment during the period of human occupation. An appendix by Blong presents an argument for the date of the latest eruptive activity which devastated the island. An accurate dating of this event is important for the study of biological recolonization of the island.