COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS:

1965/69

THE EFFECT OF VOLCANIC LOADING IN THE CAPE NELSON AREA, PAPUA

by

C.D. Branch

THE EFFECT OF VOLCANIC LOADING IN THE CAPE NELSON AREA, PAPUA

by

C.D. Branch

Records No. 1965/69

Attempts to land by helicopter on Mount Victory on the 22nd and 23rd June, 1964 were thwarted by thick cloud. The opportunity was taken therefore to examine the fiords in the Cape Nelson area, Sheet SC 55/8, which J.G. Best, Senior Resident Geologist, had suggested from an examination of the Cape Nelson air photo mosaic, were formed by subsidence caused by loading by the volcanic pile. This thesis is most probably correct.

Cape Nelson comprises an extinct volcanic complex, with three peaks named Trafalgar, Brittania, and Temeraire, which rises to a maximum elevation of 5660 feet above sea level, and Mount Victory, a dormant volcano 6315 feet high about seven miles to the south-west of the complex. The slopes of the volcano complex are deeply eroded into long narrow valleys separated by razorback ridges: on the northern and eastern sides the lower ends of the valleys are drowned and form spectacular fiords one to four miles long, with walls 100 to 500 feet high. To the south and east of Cape Nelson the coast is low-lying and gently curved, backed by extensive swamps.

In the Tufi area the fiords are eroded in a massive volcanic agglomerate or breccia, composed entirely of blocks of porphyritic andesite (may be dacite, see Morgan, 1963) $\frac{1}{8}$ inch to several feet across in a hard fine grained matrix. The origin of the deposit is uncertain and it may be either a nuee ardente deposit or a mud flow.

At the present time small swamps are forming in the ends of the fiords; the swamps in fiords on the eastern side of Cape Nelson are only a few hundred yards long, whereas those on the northern side are up to half a mile long, with streams meandering through them. A narrow wave-cut platform has formed at the present sea level in the Tufi area, and no other platforms are preserved above (? or below) this.

Proposed geological history. The data suggest that at the close of the eruptive phase of volcanic activity the volcano complex stood much higher than it does now. Subsequently, numerous large valleys were eroded in the slopes of the volcano complex. At the same time slow isostatic adjustment was taking place in response to the weight of the volcanic pile, and the complex commenced to sink: the valleys on the lower slopes were drowned, forming the fiords of the present day.

The minor silting up of the ends of the fiords and the presence of a wave-cut platform at the present sea-level suggest that the area may have ceased subsiding and is now static. In addition it is possible that the swamps in the ends of the fiords on the northern side are larger than those on the east because the northern area was the first to stop subsiding.

REFERENCE

MORGAN, W.R., 1963 - The petrology of lava samples from Mount Victory and Mount Yelia, Territory of Papua and New Guinea. Bur.Min.Resour.Aust.Rec., 1963/160 (unpubl.)