The rock is traversed by numerous quartz–prehnite veins which are cut by later fractures cemented by laumontite or lined with dusty analcime, and by still later joints filled with stilbite.

The prehnite from the above rocks appears to be rather uniformly iron-poor. Optical properties of better-crystalline material are $\alpha$ 1·615, $\beta$ 1·624, $\gamma$ 1·644 $\pm$ 0·002, $2V_\gamma$ 67 $\pm$ 2°, dispersion imperceptible; suggesting about 1 per cent $Fe_2O_3$.

2.4.2. *Wellington Peninsula.* Reed (1957) has described the petrology of the greywackes, argillites, spilites and jasperoids of Wellington Peninsula. He briefly records secondary calcite, laumontite and prehnite as coatings and veins in crush zones and considered them to be the product of shearing (Reed, 1957, p. 18). Pumpellyite is recorded from the spilites. The present notes supplement these observations on the basis of an examination of specimens (14951–14974) from the 15,000 ft south-coast section from Houghton Bay to Sinclair Head (Brodie, 1953). Quartz–prehnite veinlets, with or without calcite, sericite, albite and chlorite are here magnificently developed in tension fractures and shatter-planes in greywackes and to a less extent in argillites throughout the section. The prehnite may be coarse (>1 mm) or fine, spongy or well crystallized. Representative specimens do not vary significantly in their optical properties from those recorded above for Canterbury prehnites. In most cases detrital plagioclase is uniformly albitic and prehnite is often thinly disseminated through the matrix of the rock, but in some cases with sparse film-like veinlets of calcite–prehnite instead of quartz–prehnite, unaltered detrital oligoclase–andesine was observed. At Island Bay, laumontite was observed to replace plagioclase in some cases. In the more altered rocks, biotite shows marked loss of birefringence. Specimens (14975–14979) from Worser Bay on the west shore of Wellington Harbour were found to be less altered. They lack quartz veins or prehnite, calciferous plagioclase remains and detrital biotite has almost normal colour and birefringence. The range of alteration phenomena on Wellington Peninsula thus closely parallels that in mid-Canterbury.

2.4.3. *Other occurrences.* Brothers (1956) showed prehnite to be important both in the matrix and in quartz–prehnite veins in tension fractures of greywackes from North Auckland, and Hutton (1949a) has reported prehnite and minor pumpellyite from greywackes of Kapiti Island.

2.4.4. *Discussion.* Pumpellyite and prehnite, especially the latter, are clearly of key importance in the metamorphic history of vast tracts of Wellman's "Alpine Facies." They are here interpreted as having been derived mainly from the breakdown of detrital calciferous plagioclase and perhaps in part from calcite and clay minerals or earlier zeolites.

The following alteration stages may tentatively be recognized for the lowest grades of metamorphism of the Alpine Facies, three of them being progressive and one retrogressive:

(1) Little visible mineralogical change apart from some loss of birefringence of biotite and the formation of very fine-grained chloritic or clay minerals in the matrix. Zeolites in the matrix are rare.

(2a) Detrital plagioclase partly or completely altered to albite commonly accompained by prehnite. Associated volcanics (spilites) have mineral assemblages containing albite–calcite–pumpellyite–chlorite, and less characteristically epidote and/or prehnite and sometimes minor quartz.

(2b) Prehnite is concentrated in monomineralic veinlets and prehnite–calcite veins, without much quartz.

(3) Greywackes heavily veined with quartz–prehnite with or without pumpellyite.

(4) Fracture planes produced subsequent to the metamorphic maximum are filled by a sequence of minerals that is one of increasing hydration, namely prehnite, laumontite, stilbite, with analcime also possible before stilbite.