

NOTES ON SOME ADELIE LAND ROCKS

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Adelie Land, Antarctica, lies to the south of Australia, and is an area bounded by the parallels 66° and 67° S., and the meridians $136^{\circ}20'E.$ and $142^{\circ}20'E.$ It was annexed to France by decree of March 27, 1924.¹ Stillwell² refers to Adelie Land as a portion of the Antarctic Continent which lies in the region surrounding Longitude 143° and Latitude 67° .

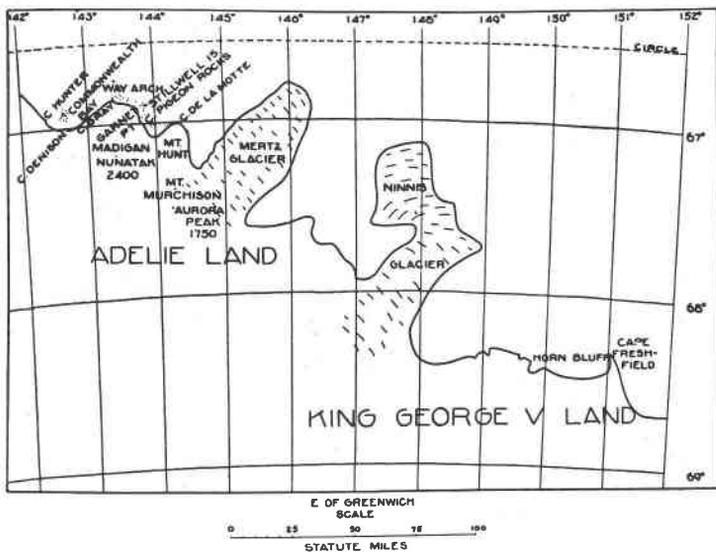


FIG. 1. Sketch map of Adelie Land and King George V Land.

However, points, as Cape Denison and Madigan Nunatak, lying to the east of $142^{\circ}20'$, are included by the Australasian Expedition as being in Adelie Land. Hobbs³ has made an intensive study of the literature pertaining to this sector of the Antarctic, and the claims of the United States, the British and the French. Figure 1 is a sketch map of the area under consideration.

¹ Joerg, W. L. G., Brief history of polar exploration since the introduction of flying. Second, revised, edition: *Am. Geogr. Soc. Special Pub.*, No. 11, p. 70, 1930.

² Stillwell, F. L., The metamorphic rocks of Adelie Land: Australasian Antarctic Expedition, 1911-1914, *Scientific Reports*, Series A.—Geography, Physiography, Glaciology, Oceanography, and Geology, vol. 3, Part 1, p. 7, 1918.

³ Hobbs, W. H., Wilkes Land rediscovered: *Geogr. Rev.*, vol. 22, No. 4, pp. 632-655, 1932.

The Adelie Land basement is a complex of gneisses and schists of probable pre-Cambrian age, which was derived from sedimentary rocks, acid intrusives, diorites and dolerites. A large number of specimens of these metamorphic rocks were taken from the moraines and the *in situ* occurrences on the coastal nunataks and islets by the Australasian Antarctic Expedition, 1911-1914. Priestley and Tilley⁴ record the occurrence of red sandstones in the moraines, indicating the continuation of the Beacon sandstone⁵ through Adelie Land. Dolerites were also noted as erratics in the moraines.⁶ In preparation are two papers on the granites⁷ and the sedimentary rocks of Adelie Land.⁸

In the University of Michigan Collections there are 12 duplicate rock specimens collected by the Australasian Expedition. The various specimens gathered by the Expedition have been reported on in part by Stillwell^{9,10}, Tilley,¹¹ Browne,¹² and Coulson.¹³

The following are the specimens in the Collections, the numbers and the terminology are the same as those of the Australasian Antarctic Expedition: 11, granodiorite gneiss, Cape Denison; 135, epidote marble (erratic), Cape Denison; 147, magnetite-garnet schist (erratic), Cape Denison; 402, forsterite marble (erratic), Cape Denison; 629, amphibolite, Cape Denison; 784, garnet-cordierite gneiss, Cape Gray; 785, hypersthene-biotite-feldspar gneiss, Cape Pigeon Rocks; 794, plagioclase-pyroxene gneiss, Madigan Nunatak; 797, hypersthene-alkali-feldspar gneiss, Madigan Nunatak; 950, biotite, hornblende schist (erratic), Cape Denison; 956, biotite-hornblende-feldspar gneiss (erratic), Cape Denison; 983, granite gneiss, Great Mackellar Island.

⁴ Priestley, R. E., and C. E. Tilley, Geological problems of Antarctica: Problems of polar research: *Am. Geogr. Soc. Special Pub.*, No. 7, pp. 318-319, 1928.

⁵ Stewart, Duncan, Jr., The petrography of the Beacon Sandstone of South Victoria Land: *Am. Mineral.*, vol. 19, pp. 351-359, 1934.

⁶ Browne, W. R., The dolerites of King George Land and Adelie Land: Australasian Antarctic Expedition, 1911-1914, *Scientific Reports*, Series A, vol. 3, Geology, Part 3, p. 245, 1923.

⁷ Summers, F. H., The granites of Adelie Land and King George Land: *Ibid.*, Part 6, (*In preparation*).

⁸ Mawson, Douglas, The sedimentary rocks of Adelie Land and King George Land: *Ibid.*, Part 7, (*In preparation*).

⁹ Stillwell, F. L., *op. cit.*, 230 pp.

¹⁰ Stillwell, F. L., Amphibolites and related rocks from the moraines, Cape Denison Adelie Land: *Ibid.*, Part 4, pp. 259-280, 1923.

¹¹ Tilley, C. E., The metamorphic limestones of Commonwealth Bay, Adelie Land: *Ibid.*, Part 2, pp. 231-244, 1923.

¹² Browne, W. R., *op. cit.*, pp. 245-258.

¹³ Coulson, A. L., Magnetite garnet rocks from the moraines, Cape Denison, Adelie Land: *Ibid.*, Part 5, pp. 281-305, 1925.

Specimens 11, 629, and 794 have been analyzed chemically and the results published by Stillwell.¹⁴ Comparisons of quantitative mineralogical data and the mineralogical compositions computed from the chemical analyses of these specimens have been recorded.¹⁵ Table 1 shows the mineralogical compositions of eleven of the metamorphic rocks.

TABLE 1. MINERALOGICAL COMPOSITION OF SOME METAMORPHIC ROCKS FROM ADELIE LAND

Mineral	Specimen										
	11	135	402	629	784	785	794	797	950	956	983 ^a
Quartz	42.80	p	—	p	p	p	p	p	p	p	26.55
Orthoclase	—	—	—	—	p	p	—	p	—	p	p
Microcline	22.30	p	—	—	p	p	—	—	—	p	62.98
Perthite	—	—	—	—	p	—	—	p	—	—	—
Albite	—	—	—	—	—	—	p	—	—	—	—
Oligoclase	20.17	—	—	—	—	—	—	p	—	p	p
Andesine	—	—	—	25.53 ^a	—	p	49.01 ^c	—	—	—	—
Plagioclase (undet.)	—	p	—	p	p	—	—	—	24.54 ^a	—	—
Muscovite	0.85	—	—	—	—	—	—	—	—	—	2.56
Biotite	13.87 ^b	—	—	0.35	p	p	3.19	p	13.05	p	5.87
Chlorite	p	p	—	—	p	p		—	—	—	
Green hornblende	—	—	—	72.51	—	—	—	—	54.40	p	—
Glaucophane	—	—	—	—	—	—	43.02	—	—	—	—
Hypersthene	—	—	—	—	—	p		—	p	—	—
Augite	—	—	—	—	—	—	—	—	—	—	—
Diopside	—	—	p	—	—	—	—	—	—	—	—
Epidote	p	p	—	0.28	—	p	—	—	p	p	p
Zoisite	—	—	—	p	—	—	—	—	—	—	—
Sphene	p	p	—	0.90	—	—	—	—	2.09	—	p
Apatite	p	p	—	p	p	p	p	p		—	p
Zircon	p	—	—	—	—	—	p	p	—	—	p
Tourmaline	?	p	—	—	—	—	—	—	—	—	—
Forsterite	—	—	p	—	—	—	—	—	—	—	—
Cordierite	—	—	—	—	p	—	—	—	—	—	—
Monazite	—	—	—	—	p	—	—	—	—	—	—
Garnet	—	—	—	—	—	p	—	—	—	—	—
Magnetite	p	p	p	—	p	p	4.68	p	5.92	p	p
Ilmenite	—	—	—	0.43	p	p		—		p	—
Pyrite	p	—	—	—	p	p	abs	p	—	p	—
Limonite	—	p	—	—	—	—	—	p	—	—	—
Hematite	p	—	—	—	—	—	—	p	—	p	—

¹⁴ Stillwell, F. L., *op. cit.*, pp. 86, 41, and 131.

¹⁵ Stewart, Duncan, Jr., The petrography of some Antarctic rocks: *Am. Mineral.*, vol. 19, pp. 150-160, 1934.

Mineral	Specimen										
	11	135	402	629	784	785	794	797	950	956	983 ^a
Serpentine	—	—	p	—	—	—	—	—	—	—	—
Leucoxene	—	—	—	—	p	—	—	—	—	p	—
Delessite (?)	—	—	—	—	—	—	—	p	—	—	—
Calcite	—	p	p	—	—	—	—	—	—	p	p
Dolomite	—	—	p	—	—	—	—	—	—	—	—
Sericite	p	—	—	p	—	p	—	p	p	p	p
Kaolin	p	—	—	—	—	p	—	—	—	—	p
	99.99			100.00			100.01		100.00		100.00

p = present in thin section.

^a Average of two thin sections.

^b Includes accessories.

^c Includes plagioclase and minute amounts of quartz.