# THE GEOLOGY OF THE BUNGER HILLS AREA, EAST ANTARCTICA—A PRELIMINARY ACCOUNT

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The Bunger Hills area of Queen Mary and Wilkes Lands, East Antarctica consists predominantly of granulite-facies metamorphics of probable late Archaean to early Proterozoic age. The most abundant rock types are felsic orthogneiss (orthopyroxene-quartz-feldspar gneiss) and paragneiss (garnet-quartz-feldspar gneiss, and aluminous metasediments with a variety of garnet-, sillimanite-, and cordierite- bearing assemblages), but subordinate mafic granulite, ultramafic rocks, quartzite, calc-silicate rocks, and marble are also present. The orthogneiss includes a major proportion of Y-depleted tonalitic composition, which probably represents new continental crust derived by partial melting of a hornblende-and/or garnet-bearing mafic source.

The metamorphics are intruded by various plutonic rocks, ranging in composition from gabbro, through diorite, quartz monzodiorite, and quartz monzonite, to granite. These are characterized by the presence of orthopyroxene and subordinate clinopyroxene, hornblende, and biotite, and were apparently emplaced under high-grade conditions during the third and final major deformation (D3) in the area. Post-dating the plutonic rocks are felsic dykes and small pink granite and pegmatite intrusions, as well as several geneattions of mfafic dykes. The latter comprise, in chronological order, folded, subconcordant mafic granulites, synplutonic mafic granulites within the major plutons, flat-lying tholeiitic dolerites, rarde magnesian doleraites (olivine tholeiites), an abundant, northwest-trending swarm of dolerites, including both transitional (slightly hypersthene - or nepheline-normative) and tholeiitic (strongly hypersthene-normative) compositions, and a varied group of mainly E-W trending alkaline dykes (mostly picritic basalt, alkali olivine basalt, or trachybasalt). Preliminary Rb-Sr isotopic data indicate a middle Proterozoic age for the abundant dolerites. Several generations of shear and mylonite zones, both pre- and post-dolerite, are present, and extensive retrograde (amphibolite-facies)metamorphism post-dated the emplacement of the dolerites in the southeast Bunger Hills.

Dolerite dykes do not appear to be present in the area to the west (i.e., west of the Denman Glacier), although outcrop is poor, and the high-grade metamorphics (felsic gneisses and metasediments) there may form part of the late Proterozoic (∿ 1000 Ma) terrane which makes up much of the East Antarctic Shield. Extensive plutonic rocks also crop out in this area, and include diorite, syenite, monzonite, and granite. Sandstones and altered basalts of possible late Proterozoic-Cambrian age crop out at the isolated Mounts Amundsen and Sandow, about 100 km south of the Bunger Hills.

Isotopic studies presently in progress should allow correlations with once continguous parts of Gondwanaland, specifically the Archaean Yilgaran Block and Proterozoic Albany-Fraser Province of Westenr Australia.