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11. Field Relations of Granite Harbour Intrusives and Associated Dikes from the USARP Mountains, North Victoria Land, and Prince Albert Mountains, Central Victoria Land, Antarctica

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INTRODUCTION

Two suites of Paleozoic intrusives are distinguished in the Transantarctic Mountains, i.e., the Cambrian to early Ordovician Granite Harbour Intrusives (GUNN & WARREN 1962) and the Devonian to early Carboniferous Admiralty Intrusives (HARRINGTON 1958; redefined by GRINDLEY & WARREN 1969). Whereas granitoids of the Admiralty Intrusives are restricted to North Victoria Land (see HENJES-KUNST this vol.) intrusives of the Granite Harbour Intrusives suite are widely distributed in a belt that runs along the edge of the Polar Plateau from the Pacific coast of North Victoria Land to the Weddell Sea (GANOVEX-TEAM 1987). Forming abundant syn- to post-tectonic plutons and batholiths they represent the clearest manifestation of the early Paleozoic Ross Orogeny in western Antarctica. Geochemically, the Granite Harbour Intrusives are gabbros to granites of calc-alkaline affinity indicative of a former active continental-margin setting (BORG et al. 1987, BORG et al. 1990, see KLEINSCHMIDT & TESSENSOHN 1987).

This report summarizes the field results of a sampling project carried out during GANOVEX VI on the Granite Harbour Intrusives in the USARP Mountains, North Victoria Land (Fig. 1), and in the Prince Albert Mountains, Central Victoria Land (Fig. 2). Samples were collected for petrographical, geochemical and geochronological analyses. These investigations will help to get a better understanding of the temporal, spatial and geochemical evolution of the igneous activity in the course of the Ross Orogeny.

NORTH VICTORIA LAND

The Paleozoic basement rocks of North Victoria Land are divided into three lithological and structural distinct units which are, from west to east, the Wilson, Bowers, and Robertson Bay Terranes (Fig. 1). Granitoids of the Granite Harbour Intrusives suite are only found in the Wilson Terrane. Their country rocks are formed by very low-grade metasediments to poly-phase high-grade gneisses of the Wilson group (see GANOVEX-TEAM 1987). We sampled Granite Harbour Intrusives granitoids in the Pomerantz Tableland, Daniels Range, Helliwell Hills, Morozumi Range and at Renirie Rocks (Fig. 1). Pomerantz Tableland is mainly built up by the Mono Batholith (STURM & CARRYER 1970), a rather homogeneous biotite granite with abundant K-feldspar megacrysts up to 10 cm in size. At the SE margin of the Mono Batholith megacrysts show a parallel orientation due to ductile deformation (KLEINSCHMIDT this vol.). Granitoids of Daniels Range, Helliwell Hills, Renirie Rocks and Morozumi Range form plutons of smaller size which are associated with pegmatites and, in part, migmatitic country rocks. These intrusives are mostly medium-grained to slightly K-feldspar-porphyritic biotite granites; a two-mica granite was only found at Renirie Rocks.

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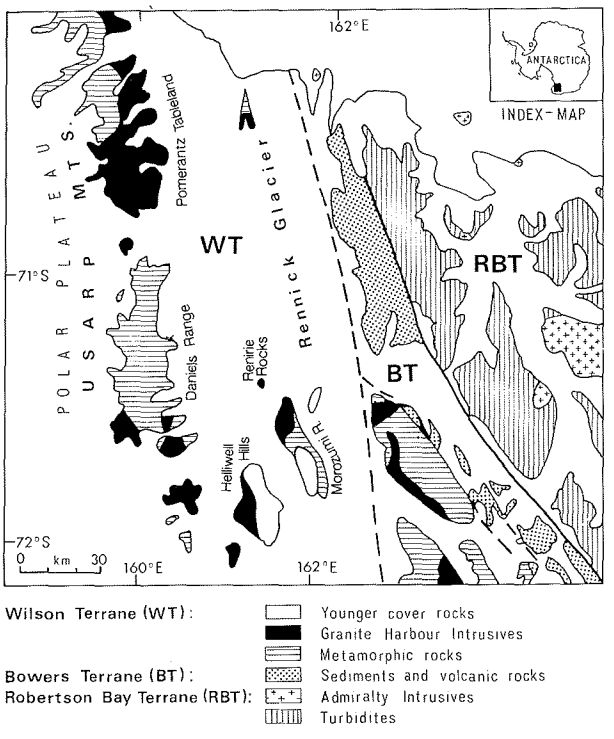

Fig. 1: The three tectonic terranes, Wilson Terrane (WT), Bowers Terrane (BT) and Robertson Bay Terrane (RBT), in the basement rocks of North Victoria Land, Antarctica.

Abb. 1: Die drei tektionischen Terranes im Grundgebirge von Nordvictorialand. WT = Wilson Terrane, BT = Bowers Terrane, RBT = Robertson Bay Terrane.

CENTRAL VICTORIA LAND

In Central Victoria Land the working area was located in the central and southern Prince Albert Mountains bounded by the Reeves Glacier in the north and the Fry Glacier in the south. Here, the Granite Harbour Intrusives occur in a narrow belt of about 50 km width which runs parallel to the coast of the Ross Sea (Fig. 2). No country rocks are exposed in this area. There are, however, large rafts of Priestley Schists (see GANOVEX-TEAM 1987) exposed in granitoids south of Mt. Smith and Mt. Murray, south of Walker Rocks (TESSENSOHN et al., this vol.), and south of the Mt. Chetwynd area. These isolated occurrences of metamorphic rocks are tentatively interpreted as remnants of the former roof of Wilson-Group country rocks.

Two types of Granite Harbour Intrusives plutons are distinguished in the central and southern Prince Albert Mountains, i.e. composite intrusions built up by granitoids with relatively high amounts of mafic minerals and homogeneous plutons of leuco-granitoids. Igneous rocks of the first group are mostly grey coloured and contain abundant mafic xenoliths. Typical outcrops are found at Mt. Larsen and at Walker Rocks (see TESSENSOHN et al. this vol.). Granitic rock types predominate; intrusives of dioritic to gabbroic compositions were only found in subordinate amounts in the Mt. Bellingshausen and Mt. Larsen area and in small outcrops in the Mt. George Murray area. Mafic minerals are biotite and amphibole; primary muscovite has not been observed. Field relations indicated that the plutons were formed by multiple intrusions of geochemically distinct magma pulses. Earlier intrusives may show foliation thus indicating a late to post-tectonic origin of the composite plutons. The second type of intrusives is mostly found in isolated outcrops aligned along the Ross Sea coast. There are, however, some leuco-granitoids which intruded composite plutons of the first group of granitoids as, for instance, at Mt. Gauss. Leuco-granitoids are of grey or pink colour and generally lack mafic inclusions and foliation.

Both types of Granite Harbour Intrusives plutons found in the Prince Albert Mountains are distinguished from those of North Victoria Land in that they are cut by abundant N-S to NE-SW trending dikes. The dike rocks are of andesitic to rhyolitic composition and show a variety of rock textures and rock colours.

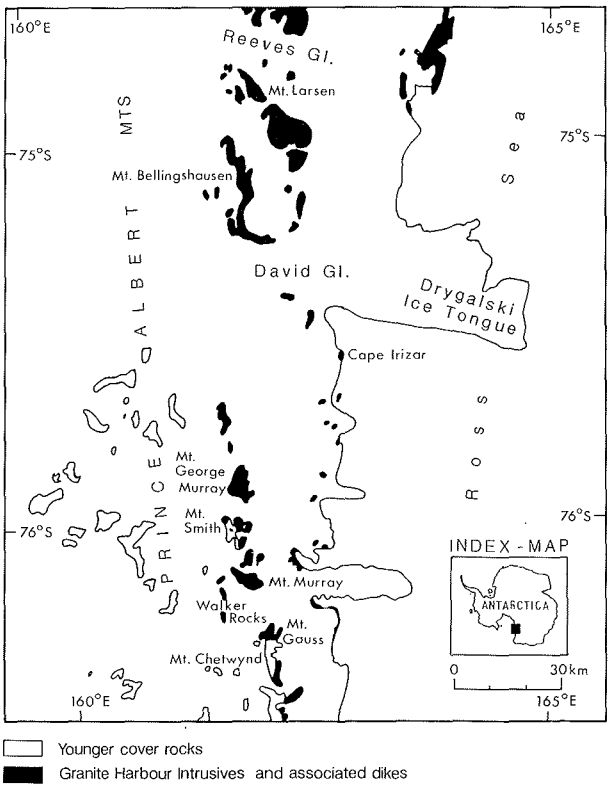

Fig. 2: Geological outcrops in the Prince Albert Mountains of Central Victoria Land, Antarcica.

Abb. 2: Die Prince Albert Mountains im zentralen Victorialand. Weiß = Deckgebirge, schwarz = Intrusiva im Grundgebirge.

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