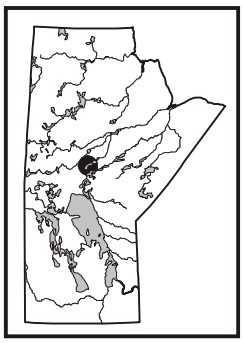
GS-6 PETROLOGICAL INVESTIGATIONS AT SIPIWESK LAKE (PART OF NTS 63J/16)

by C.D. Lettley[1]



Lettley, C.D. 2000: Petrographic investigations at Sipiwesk Lake (part of NTS 63J/16); *in* Report of Activities 2000, Manitoba Industry, Trade and Mines, Manitoba Geological Survey, p. 24-25.

SUMMARY

Five days were spent at western Sipiwesk Lake examining the metamorphic transition between the Archean Pikwitonei Granulite Domain and the Paleoproterozoic, amphibolite-grade, Thompson Nickel Belt terrane. Field work focused on collecting samples from layers of leucocratic, mesocratic and melanocratic rocks that could be reliably traced across this well defined metamorphic boundary. In addition, a series of samples was collected from a well exposed, layered mafic-ultramafic complex of the Pikwitonei Domain to study metamorphic reaction textures at granulite grade. Results of these studies will be reported in a B.Sc. thesis, which is now in progress.

GEOLOGY AND SAMPLING

Hudsonian Front

The Pikwitonei granulites (Mezger et al., 1990) at western Sipiwesk Lake are characterized by isoclinally folded layers of leucocratic and mesocratic granulite gneiss, invaded by layers of 'M2' mobilizate (Hubregtse, 1980), which consists of plagioclase+quartz±hornblende±orthopyroxene. The granulite also hosts rare ultramafic boudins and is cut by Molson dykes (Scoates and Macek, 1978; Ducharme, 1999).

Effects of the Trans-Hudson orogeny extend into western Sipiwesk Lake. Progressing west from the unaltered granulite in the eastern part of the area, the first visible effects of the Hudsonian overprint are zones of retrogression spatially associated with millimetre- to centimetre-scale veins filled with quartz and followed by pegmatite. Individual lithological layers can locally be traced across a relatively sharp boundary of retrogression (Fig. GS-6-1), allowing for the sampling of both retrogressed and pristine rocks from the same layer. Farther west, toward the Thompson Nickel Belt, metamorphic retrogression is accompanied by a tectonic overprint and by increase in the abundance of subhorizontal pink pegmatite veins. Samples of specific lithological assemblages were gathered from localities exhibiting differing degrees of retrogression and deformation.

Layered Mafic-Ultramafic Complex

A layered mafic-ultramafic complex, at the mouth of the Nelson River's west channel, was examined and sampled in detail to study metamorphic mineral assemblages and derive original mineralogical compositions of individual layers. Within the mafic portion of the complex, assumed to be metagabbro, layering is accentuated by the presence of abundant garnet in some layers, and its absence in others. Locally, the garnet can be seen to be developed from orthopyroxene, usually in very coarse texture, by a macroscopic reaction involving orthopyroxene, plagioclase and quartz.

[1] Department of Geology, Brandon University, Brandon, Manitoba

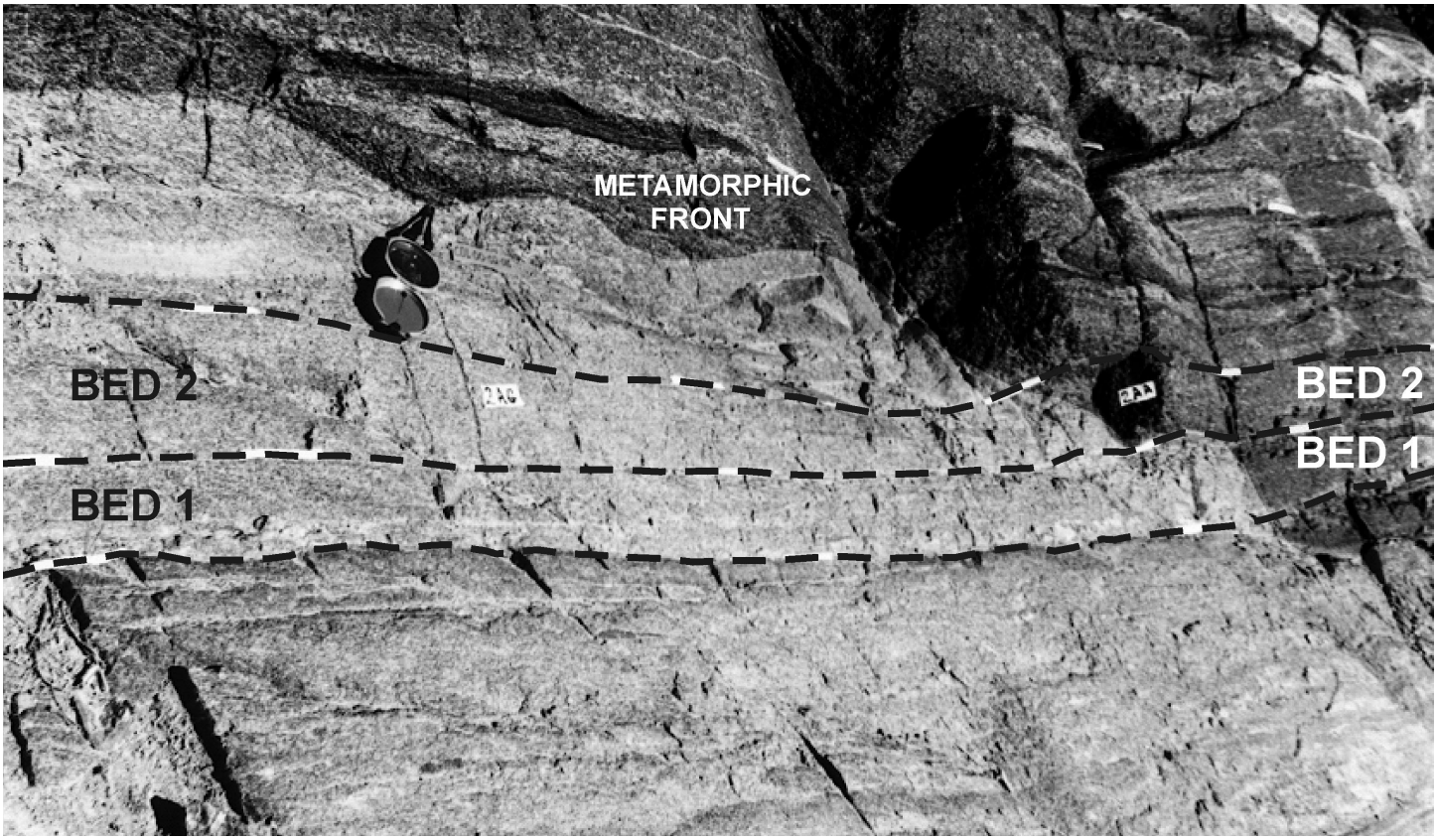


Figure GS-6-1: Zone of retrogression (upper right) cuts obliquely through layering in granulite. Individual layers (highlighted by white tape) can be traced from unaltered granulite into retrograde amphibolite. Note compass for scale.

In one location, well developed coronas (Fig. GS-6-2) consisting of orthopyroxene+quartz+garnet+plagioclase were sampled in order to characterize the garnet-producing reactions. These are the first coronas found in mafic rocks on Sipiwesk Lake. No coronas in the ultramafic part of the complex, analogous to those described by Macek (1989), were observed.

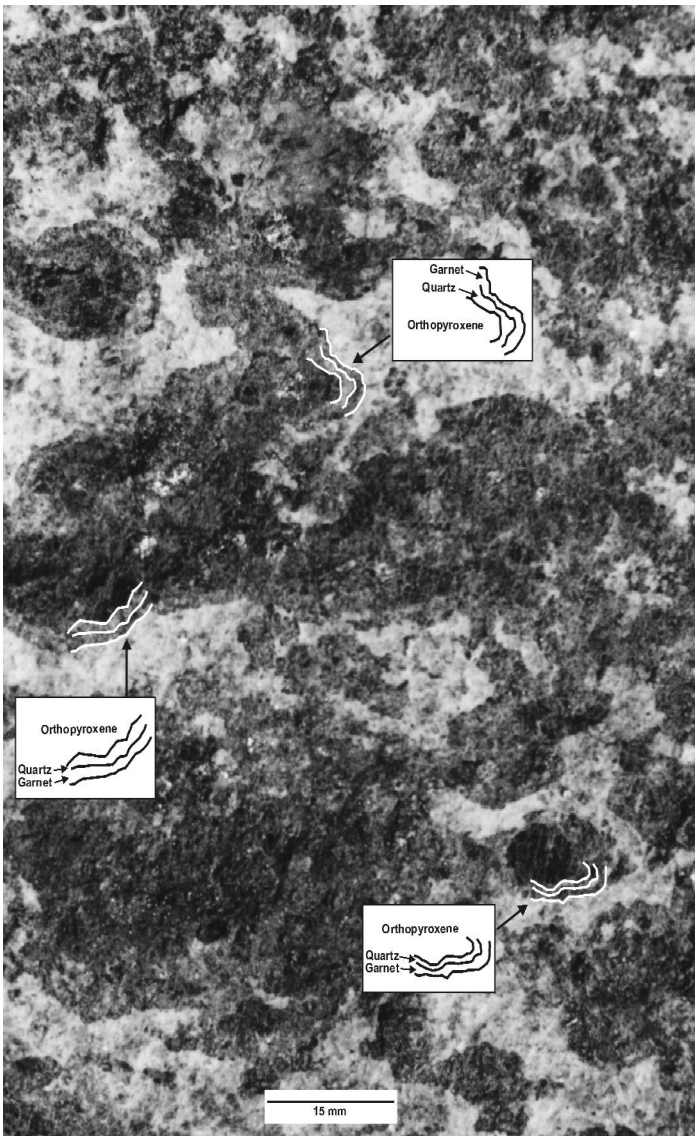


Figure GS-6-2: Coronas from layered mafic body. Orthopyroxene is rimmed by quartz and garnet. Image is approximately 1.5 times actual size.

FUTURE WORK

Over the course of the 2000-2001 academic year, microscopic, microprobe and chemical analyses of the samples will be performed. An analysis of the results will be conducted and research findings will be presented in fulfilment of B.Sc. requirements.

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