

rims around olivine. Accessory minerals include apatite and pyrite, plus sporadic pyrrhotite, chalcopyrite, and pleonaste spinel (rare), the latter occurring typically as tiny cores in magnetite grains.

Olivine, magnetite, and ilmenite concentrations in the Glen Creek Gabbro have given rise to unusual ultramafic masses that have been described petrographically by Powell and Fischer (1976) and Hanks (1978). Olivine (20–60 percent), magnetite (21–60 percent), and ilmenite (2–17 percent) together compose 72 to 99 percent of the mode (fig. 93). (Modal data reported in this section are based on 1,000 point-counts, each in transmitted and reflected light, on 30 ultramafic, 3 “transitional,” and 26 gabbro samples.) Other phases in the ultramafic masses are interstitial to olivine and oxides, and include clinopyroxene (0–6 percent), orthopyroxene (0–1.2 percent), plagioclase (0–16 percent), pinkish-brown, kaersutitic amphibole (0.3–10.7 percent), and pleonaste spinel (0.1–1.6 percent). Trace amounts of red-brown phlogopite and sulfides also are present.

Representative pyroxene and olivine compositions from the Glen Creek Gabbro (gabbroic portions) are listed in tables 22 and 23, respectively, and are plotted in figure 94 along with some compositions from

an ultramafic sample. Amphibole and phlogopite compositions from gabbro and ultramafic material are shown in tables 24 and 25, respectively. Systematic differences in $Mg/(Mg + Fe)$ ratios of mafic silicates, between the gabbro and ultramafic rock as well as the gradational changes through modally transitional rocks, are illustrated in figure 95. The plagioclase composition averages An_{62} in both the gabbroic and ultramafic rocks.

Although their modes are exotic, the ultramafic masses have essentially the same mineralogy as the “ordinary” Glen Creek Gabbro that envelopes them. In mapping detailed relationships in the excavation known locally as Reid's magnetite pit (fig. 74), Hanks (1978) demonstrated the interfingering of gabbro and ultramafic rock (fig. 96) and the gradational “contacts” between the two rock types. Although smoothly gradational, the transition between them occurs on the scale of a few inches. The ultramafic masses are enveloped by gabbroic material that also occurs as small lenses or pods surrounded by the ultramafic material (fig. 96). These observations indicate an intimate genetic relationship between the olivine-oxide rock and the Glen Creek Gabbro, the former representing segregations within the latter. The ver-

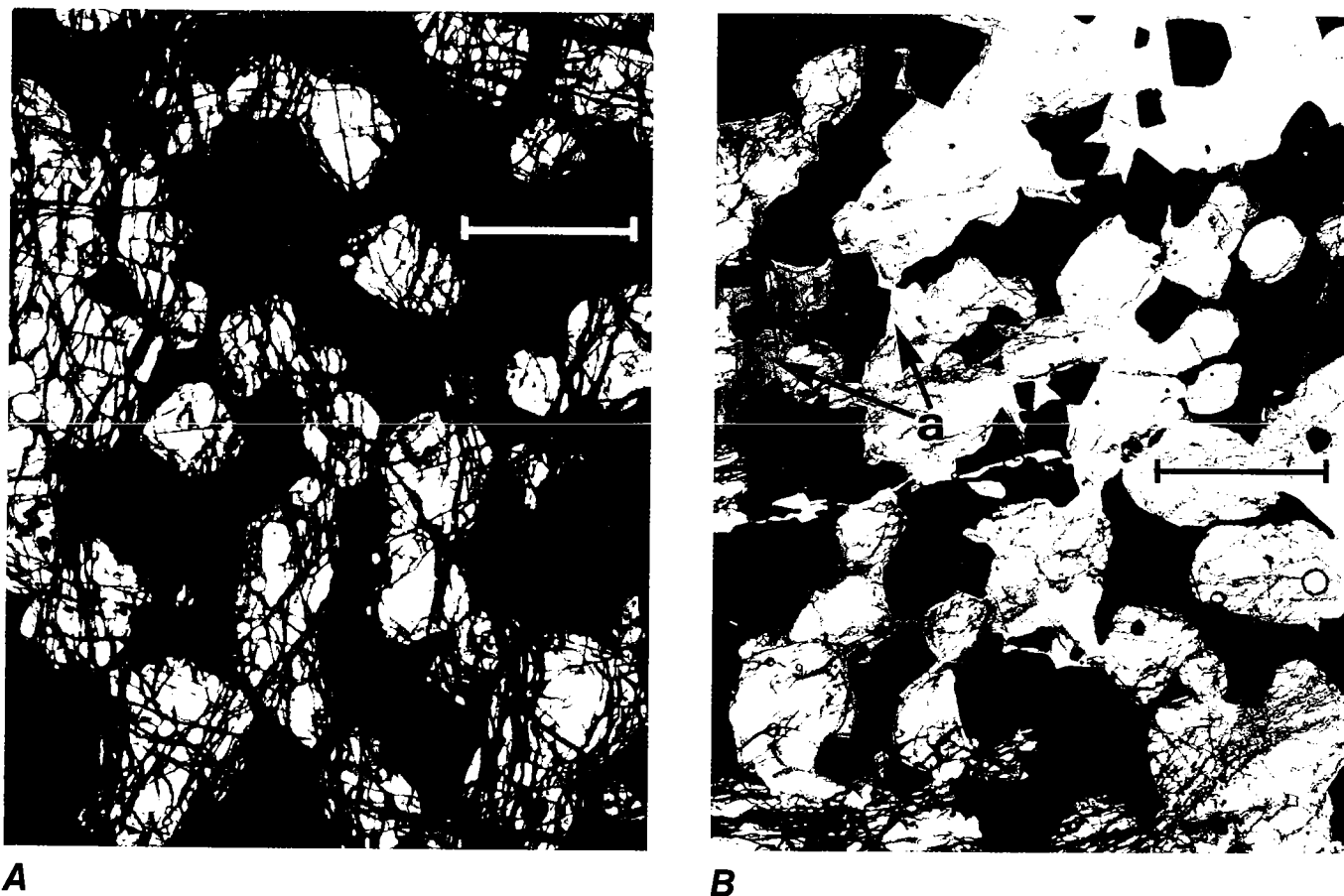


Figure 93. Photomicrographs illustrating ultramafic segregation within Glen Creek Gabbro. A, magnetite-ilmenite-rich area; transparent grains are olivine. B, olivine-rich area; opaques are magnetite and ilmenite; note minor amphibole (a). Bar is 0.5 mm. (Sample WM-136.)