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IGNEOUS GEOLOGY OF COOPERTON QUADRANGLE WICHITA MOUNTAINS

Marjorie L. Stockton
Joe D. Giddens III

INTRODUCTION

Three of the major divisions of the Wichita igneous complex crop out in the Cooperton Quadrangle. These are the Glen Mountains Layered Complex, the Roosevelt Gabbros, and the Mount Scott Granite. Other rock types occur in minor amounts (fig. 34). Chase (1950b) prepared a map that included most of this region, but his lithostratigraphy has been superseded by that described in Powell and others (1980).

The Cooperton 7.5-minute Quadrangle lies along the boundary between Kiowa and Comanche Counties. It covers parts of Ts. 3, 4, and 5 N., Rs. 15 and 16 W., and includes the western edge of the Wichita Mountains Wildlife Refuge.

GEOLOGY

Glen Mountains Layered Complex

The Glen Mountains Layered Complex forms the hills and low-lying outcrops in the southwestern quarter of the quadrangle. This sequence of anorthositic cumulate rocks is characterized by variably developed igneous lamination and rhythmic layering. The body strikes west-northwesterly and dips about 10° to the north-northeast. Local variations in strike are common.

The Glen Mountains Layered Complex was first mapped in detail in the Glen Mountains Quadrangle to the west, and was subdivided into sequential stratigraphic zones by M. C. Gilbert (1960) and A. B. Spencer (1961). The zones in the Cooperton Quadrangle are essentially similar to those previously described.

The lowermost zone, called the K Zone, is present only in the southwestern corner of the Cooperton Quadrangle and in the northwestern corner of the Odetta Quadrangle to the south (NW¼ sec. 11 and NE¼ sec. 15, T. 3 N., R. 16 W.). It consists of alternating layers of anorthosite and olivine gabbro, with isolated occurrences of coarse-ophitic pyroxene. The L Zone, stratigraphically overlying the K Zone, also has only a small outcrop area. It is predominantly anorthosite, and contains irregular masses of coarse-ophitic clinopyroxene as much as 25 cm in diameter. Igneous lamination is pronounced. The M Zone, overlying the L Zone, consists of anorthosite, anorthositic gabbro, and olivine gabbro, and is characterized by spherical, 1-6-cm fine-ophitic pyroxenes. The uppermost zone, the N Zone, has not been previously described (table 14). It consists of anorthositic gabbro with irregularly shaped subophitic pyroxenes, sparse olivine, and minor amounts of quartz, which may be secondary. Unlike the underlying zones in which no primary hydrous phases occur, traces of late-magmatic biotite and brown hornblende can be found locally in the N Zone.

Roosevelt Gabbros

The Roosevelt Gabbros are intrusive into the Glen Mountains Layered Complex. Two distinct bodies of these gabbros occur in the Cooperton Quadrangle: the Sandy Creek Gabbro, and a rock unit informally called the Mount Baker hornblende gabbro.

The Sandy Creek Gabbro, described by Powell and others (1980, p. 1935–1944), is a biotite, two-pyroxene gabbro that locally is olivine rich. It crops out in secs. 3, 4, 5, and 9, T. 3 N., R. 15 W.

The Mount Baker hornblende gabbro forms the base of Mount Baker and can be seen on the lower slopes, in secs. 17, 18, and 19, T. 4 N., R. 15 W. This biotite–hornblende, two-pyroxene gabbro is variable in grain size and texture and is much finer grained than the Sandy Creek body. Olivine is absent. Quartz is generally present, both as interstitial grains and as small microcrystalline pods. In some places, the rocks contain cavities filled with quartz and potash feldspar. Magnetite crystals as much as 15 cm in diameter have been found as float in areas peripheral to the Mount Baker gabbro. Their origin or relation to the gabbroic rocks is unknown. The Mount Baker body is nowhere in contact with the Sandy Creek body, and their relative ages have not been established.

Numerous dikes of biotite microgabbro, considered to be related to the Roosevelt Gabbros, cut the Glen Mountains Layered Complex throughout the outcrop area.

Mount Scott Granite

The Mount Scott Granite is a quartz–perthite granite containing some primary plagioclase, hornblende as the dominant mafic mineral, and magnetite, biotite, apatite, zircon, and sphene. Gray, ovoid feldspar phenocrysts are characteristic. The texture is variably micrographic.

The Mount Scott is younger than the mafic rocks. It was emplaced as a sill, as evidenced by a generally horizontal gabbro floor and, farther to the east, a cover of rhyolite. (The rhyolite has been eroded away over all of the Cooperton Quadrangle.) The Mount Scott Granite caps the mountains in the eastern half of the quadrangle.