

STOP 2—HIGHWAY 54 AREA

Transition between M and N Zones of Glen Mountains Layered Complex. Secs. 25–27, 34–36, T. 4 N., R. 16 W., Kiowa County, Oklahoma. M. L. Stockton and J. D. Giddens III.

Introduction

Parking locations for the M and N Zones are marked as P on the accompanying map (fig. 99). Access to the Willis Ranch (sec. 34 and most of sec. 27) and to the NW¼ sec. 35 is controlled by Jerry Treadwell. The NW¼ and the NW¼SW¼ of sec. 26 are owned by James Raasch.

The remainder of sec. 26, the NE¼ sec. 35, and the S½ sec. 25 may be entered by permission of James or Nick Callen. The Callen ranch house is located in the center, NE¼ sec. 26. Access is from the section-line road to the north, ¾ mile east of State Highway 54.

The only earlier map available for this area is by Chase (1950b). He located many of the outcrops, but his definitions of the mappable units have been superseded by later work. Alipouraghtapeh (1979) did a reconnaissance geochemical study of the Raggedy Mountain Gabbro Group in this area. Table 26 lists three bulk-rock determinations of samples noted on the map (fig. 99).

Geology

M Zone rocks in the Cooperton Quadrangle are essentially similar to those in the Glen Mountains Quadrangle, described by Gilbert (1960) and Spencer (1961).

Rock types are anorthosite, anorthositic gabbro, and olivine gabbro. The characteristic pyroxenes are of fine-ophitic texture; that is, the plagioclase crystals within the pyroxene are anhedral, randomly oriented, and much smaller than those of the surrounding matrix (fig. 100). The pyroxenes are nearly spherical, ranging in size from 1 to 6 cm. They typically stand out in relief, and the rocks have very rough, lumpy surfaces where weathering has been severe. In many places, the pyroxenes occur in layers or bands, or small, ophitic crystals may cluster together in larger masses (fig. 101).

Olivine is abundant, although it is not present in all rocks. Crystals are small (2–5 mm) and are most commonly represented as weathered pits on rock surfaces (fig. 102). Olivine may accumulate in layers, as discrete grains or in combination with fine-ophitic pyroxenes, but more commonly they are randomly distributed.

Plagioclase lamination is well developed in many outcrops and is present to some degree in most.

Within the map area, a number of outcrops are transitional to the N Zone.

Overlying the M Zone is a section of rock that does not crop out to the west in previously mapped areas. It is here indicated as the N Zone.

The N Zone bears some resemblance to both the M and L Zones. The predominant rock type is anorthositic gabbro with a few occurrences of anorthosite.

The N Zone is characterized by clinopyroxene of two textural types. The first type shows zoned ophitic crystals with distinct cores and marginal halos (figs. 103, 104). The dense, pyroxene-rich core encloses small, anhedral plagioclase grains, and is similar to the fine-ophitic pyroxene common in the M Zone. The core is rimmed by an optically continuous halo in which the pyroxene is less abundant and is interstitial among larger, subhedral plagioclase crystals. This type is common where present, but it is found in only a few areas in the Cooperton Quadrangle.

TABLE 26.—ANALYSES OF SAMPLES FROM GLEN MOUNTAINS LAYERED COMPLEX

(From Alipouraghtapeh, 1979)

Wt %	M-Zone	N-Zone	
	WC-31	WC-32	WC-33
SiO ₂	48.73	49.71	47.40
TiO ₂	0.15	0.56	0.20
Al ₂ O ₃	34.50	32.00	30.00
FeO ¹	0.80	2.10	2.95
MgO	0.38	1.63	1.34
MnO	0.02	0.02	0.02
CaO	11.97	12.00	(3.70)
Na ₂ O	2.73	3.68	3.10
K ₂ O	0.19	0.23	0.23
P ₂ O ₅	0.16	0.30	0.27
ppm			
Cu	21	34	50
Cr	3	5	14
Zn	26	26	30
Pb	10	20	30
Ni	16	16	25
Ba	60	65	70
Sr	567	494	460
V	30	70	90
Total	99.64	102.23	(99.10)

1. = all Fe as FeO