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A STRATIGRAPHIC SECTION OF THE SIERRA BLANCA VOLCANICS IN THE NOGAL PEAK AREA, LINCOLN COUNTY, NEW MEXICO

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Sierra Blanca was once described as an intrusive complex, but recent workers now recognize its dominant volcanic character. Continuous exposures of volcanic rocks are present throughout much of the steep western slope of Sierra Blanca. This paper presents a stratigraphic section of these rocks. This section extends from the ridge north of Elder Canyon (fig. 1) to the top of Nogal Peak almost four miles to the east. Three thick laterally-continuous andesite flows that have continuity throughout much of the area were recognized and used for correlation purposes.

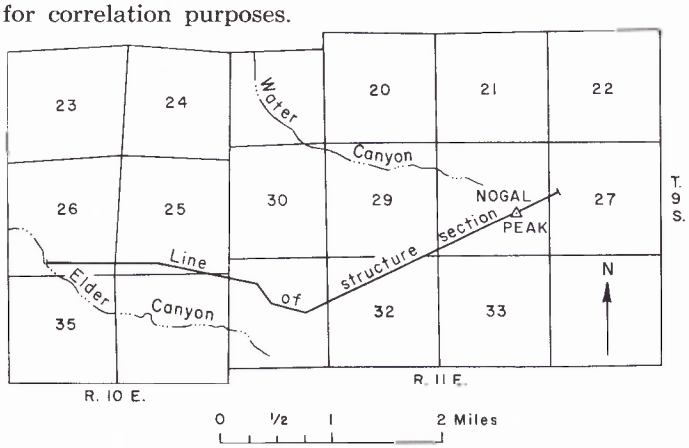


Figure 1. — Index map of the Nogal Peak area showing the location of the cross-section shown in figure 3.

The volcanic sequence (fig. 2) rests unconformably on the McRae (Cub Mountain of Bodine, 1956) Formation of Tertiary age, which, in this area, probably is more than 2,000 feet thick and includes interbedded conglomerate, sandstone, and shale (Griswold, 1959, p. 12). The basal unit of the volcanic sequence (unit 1) is a volcanic breccia consisting of rounded to angular hornblende andesite and andesite fragments in a matrix of reddish-brown to maroon hornblende andesite.

The succeeding volcanic rocks consist of dark-gray to purplish-gray andesite, hornblende andesite, and andesite breccia. Unit 18 is a thin bed of tuff. The tuff is entirely crystalline and none of the particles are greater than ¼ mm in maximum dimension. Angular hematite-coated plagioclase is the major constituent, and minor quantities of quartz and muscovite are present. Unit 30 is the lower of three massive andesite porphyry flows that form steep cliffs along the upper part of western Sierra Blanca. Units 32 and 34 directly overlie thin units of breccia and andesite flows and form massive cliffs. Unit 34 has been traced approximately 10 miles to the south along the western face of the mountain and is present on the east side of the drainage divide of Sierra Blanca. By tracing this unit to the head of Water Canyon it was possible to measure the entire stratigraphic section to the top of Nogal Peak.

The uppermost flow of the Nogal Peak section (unit 41) is a porphyritic hornblende andesite consisting of andesine (An_{43}) phenocrysts in a matrix of plagioclase and pyroxene with traces of magnetite, apatite, and cristobalite. Latitic flows have been noted by Weber on Church Mountain (Griswold, 1959, p. 13) approximately 4½ miles northeast of Nogal Peak; however, the relationship between these two units is not known.

Some of the units studied are remarkably uniform in lateral extent (fig. 3); however, there are irregularities in thickness of the units as well as in depositional surfaces. The relief on the depositional surface for any particular eruption does not appear to be great. Commonly, a single volcanic eruption commenced with accumulation of breccia containing fragments as much as three or four feet in diameter. The size of these fragments decreases upward in the flow, and the upper and last part of the eruption is free of breccia. Evidence in the form of a zone of petrified trees indicate there was a local hiatus between two volcanic eruptions at a locality about 10 miles south of Nogal Peak. This zone is not present in the Nogal Peak section.

The actual measured thickness of the Sierra Blanca volcanic rocks exposed in the Nogal Peak area is 3,340 feet. The thickness of the volcanic pile was estimated to exceed 4,000 feet (Griswold, 1959, p. 13).

Flow centers have not been definitely located but several stocks in Sierra Blanca (see Kelley and Thompson, this guidebook) probably were the sources of the Sierra Blanca volcanic rocks.

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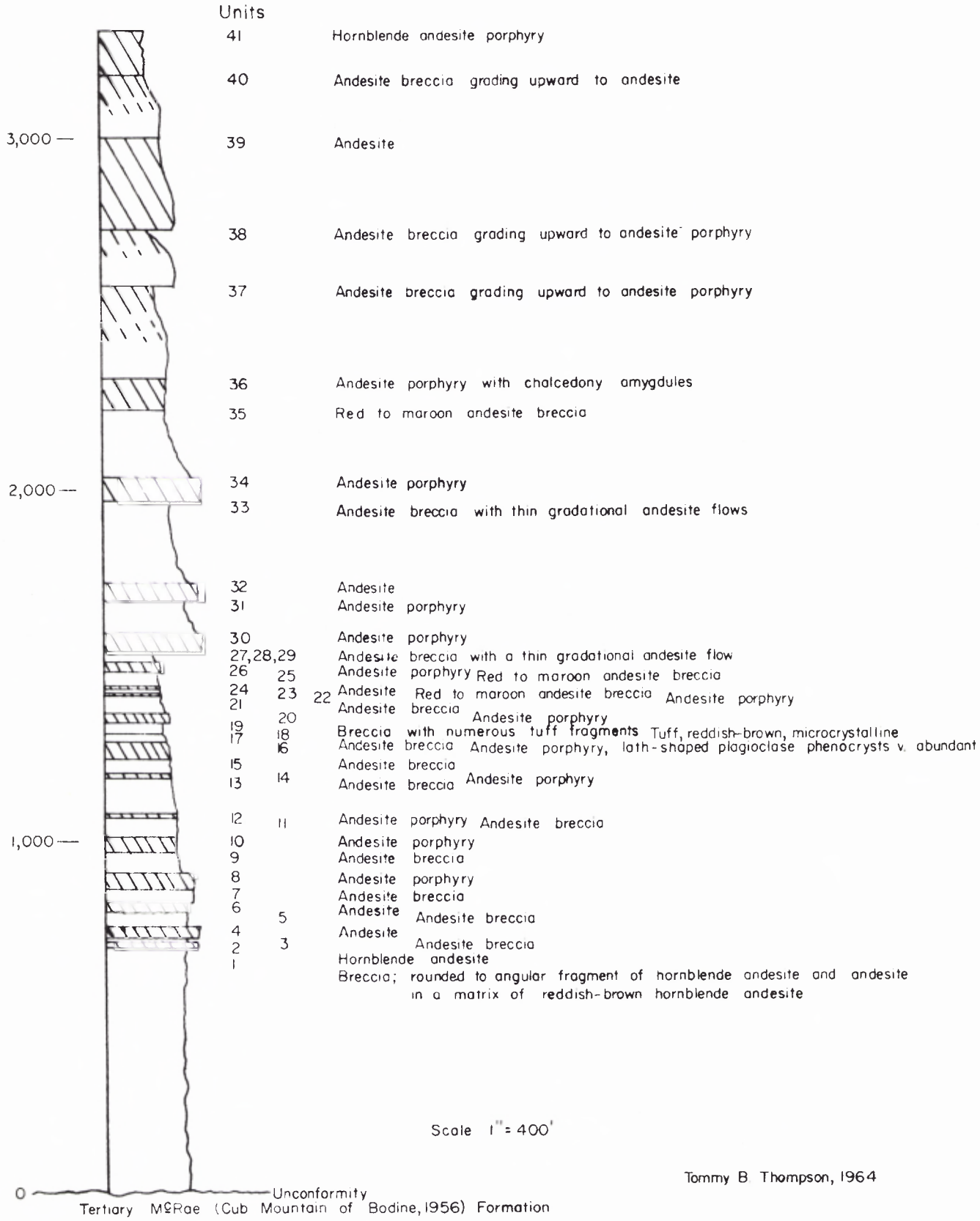


Figure 2. — Graphic section of the Sierra Blanca Volcanics in the Nogal Peak area, New Mexico.

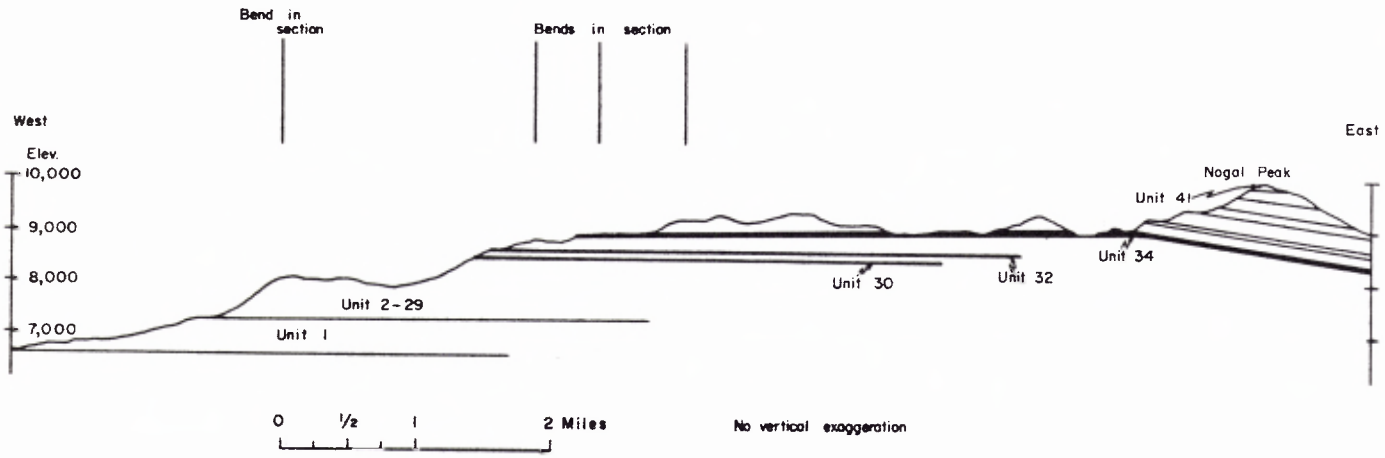


Figure 3. — Stratigraphic cross-section, Nogal Peak area, New Mexico. Units are the same as those in figure 2.