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#1274 Stratigraphic Nomenclature of  
c.3 Volcanic Rocks in the  
Jemez Mountains, New Mexico

By R. A. BAILEY, R. L. SMITH, and C. S. ROSS

CONTRIBUTIONS TO STRATIGRAPHY

GEOLOGICAL SURVEY BULLETIN 1274-P

*New stratigraphic names and revisions  
in nomenclature of upper Tertiary and  
Quaternary volcanic rocks in the  
Jemez Mountains*



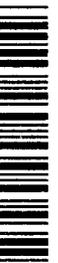
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STRATIGRAPHIC NOMENCLATURE OF VOLCANIC ROCKS  
IN THE JEMEZ MOUNTAINS, NEW MEXICO

By R. A. BAILEY, R. L. SMITH, and C. S. ROSS

ABSTRACT

Upper Tertiary and Quaternary volcanic rocks of the Jemez Mountains are subdivided into three groups—the Keres Group, in the south, the Polvadera Group, mainly in the north, and the Tewa Group, in the central and flanking parts of the mountains.

The Keres Group is divisible informally into two subgroups—an older subgroup, consisting of the basalt of Chamisa Mesa and the Canovas Canyon Rhyolite, and a younger subgroup, consisting of the Paliza Canyon Formation and the Bearhead Rhyolite. The older subgroup is a basalt-rhyolite association; the younger subgroup is a more differentiated basalt-andesite-dacite-rhyolite association.

The Polvadera Group includes the Lobato Basalt; the andesites, dacites, and quartz latites of the Tschicoma Formation; and El Rechuelos Rhyolite. These formations constitute a still younger basalt-andesite-dacite-rhyolite association in the Jemez Mountains.

The Tewa Group includes the Bandelier Tuff, Cerro Rubio Quartz Latite, Cerro Toledo Rhyolite, and the Valles Rhyolite and represents the climax of rhyolitic volcanism in the Jemez Mountains.

Subdivision of the Bandelier Tuff is revised so that it consists of only two members—the Otowi Member, which includes the Guaje Pumice Bed, and the Tshirege Member, which includes the Tsankawi Pumice Bed. The Valles Rhyolite is subdivided into six new members. Ages of many of the formations are refined by radiometric dating.

INTRODUCTION

The main purpose of this paper is to define and briefly describe new geologic formations recognized and mapped in the Jemez Mountains volcanic field in north-central New Mexico. The nomenclature of some previously described units is revised. The formations are shown on the geologic map of the Jemez Mountains (Smith and others, 1969).

atches also are known to be nearly 30 miles from El Cajete, for example, in the canyon of the Santa Fe River, near La Bajada, in the Aqua Fria quadrangle. In the rim of El Cajete crater and in El Cajete Canyon, the member has a maximum thickness of about 250 feet.

The youngest rock directly overlain by the El Cajete Member is the South Mountain dome-flow of the Valle Grande Member of the Valles Rhyolite. Inclusions of Battleship Rock welded tuff in the El Cajete Member, however, indicate that the El Cajete postdates the Battleship Rock Member also. The El Cajete Member is overlain only by the Banco Bonito Member. A charcoal sample (U.S.G.S. No. W-553), collected from a thin ash-flow unit overlying El Cajete pumice on a roadcut at the crossing of Route 4 with the East Fork of Jemez Creek, was dated as greater than 42,000 years B.P. (before present) (Meyer Rubin, written commun., 1965).

#### BANCO BONITO MEMBER

The name Banco Bonito (pronounced bahn'-ko bon-ee'-toe) Member of the Valles Rhyolite is proposed for the porphyritic obsidian flow that fills the southwestern moat of the Valles caldera. It is named for Banco Bonito, the steep slope forming the south margin of the flow in the central part of the Jemez Spring quadrangle.

The Banco Bonito obsidian flow issued from a vent immediately west of El Cajete crater, flowed west 3 miles, and then bifurcated into two tongues, one of which flowed north and the other south, each an additional 2 miles. Although sparsely forested with ponderosa pine, the flow is virtually unmodified by erosion, and concentric pressure ridges on the flow surface are well preserved.

The basal contact of the Banco Bonito flow is well exposed only along its western margin, in the vertical cliff forming the east wall of upper San Diego Canyon. Here the flow fills steep narrow valleys cut into underlying welded ash flows of the Battleship Rock Member. On its southern margin, the flow unconformably overlies red beds of the Abo Formation and disconformably overlies the South Mountain flow of the Valle Grande Member and the El Cajete Member of the Valles Rhyolite.

The Banco Bonito obsidian flow is the youngest eruptive unit in the Jemez Mountains and is probably not more than 100,000 years old. The flow postdates the youngest unit of the Valle Grande Member which has been dated as 0.43 m.y. old (Doell and others, 1968). It also postdates a thin ash-flow unit that has been dated as greater than 42,000 years B.P. by carbon-14. Conformity of the basal contact of the obsidian flow with the thin ash-flow unit and the well-preserved surface features on the obsidian flow suggest that its age is nearer 42,000 years than 0.43

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