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*Grizzly Canyon
Mt Mc Longlin Quadrangle
South Fork Little Butte Creek*

February 21, 1964

Mr. Robert Snoich
Supervisors Office
Rogue River National Forest
Medford, Oregon

Dear Mr. Snoich:

After our visit to Grizzly Canyon on Wednesday and after viewing the aerial photographs of the area, I can give you a general idea of the origin of the present topography and a description of the rocks that make up the steep hillsides and walls of the canyon.

The rocks exposed in the steep hillsides and walls of Grizzly Canyon are thick layers of volcanic breccia, tuff breccia, with some agglomerate. At least one layer high in the sequence was a lighter colored ash flow tuff and at several places thin lava flows are intercalated with the volcanic breccias. This section of heterogeneous pyroclastic rocks has been described and named by F. G. Wells in USGS Map GQ 89, Geology of the Medford Quadrangle, Oregon-California, 1956, as the Little Butte series of the volcanic rocks of the Western Cascades. They appear to be mainly andesitic in composition, but both basalt and rhyolite rock types are present attesting to the variety of volcanic eruptions from which they originated. Wells has dated these rocks as Oligocene (30 Million years) from fossil plants found with the Little Butte series.. Intense erosion has obliterated all initial volcanic land forms, later gentle folding has further complicated the picture and the vents or fissures from which the rocks were erupted are not apparent. The layered volcanic breccias have a general dip to the northeast.

The whole series of volcanic breccias is susceptible to differential weathering and erosion, and a combination of these processes has produced the pillars, columns, pinnacles, pedestal rocks, overhangs, hollows, and niches that can collectively be called "hoodoo" rocks. Structure within the breccia layers; vertical jointing, the soft easily weathered nature of the matrix, the dense harder rock fragments, and the differing resistance to erosion of the different layers have all combined to give the conditions which result in this hoodoo type erosional pattern in Grizzly Canyon.

I am sending you a copy of our Dec., 1963 Ore.-Bin which contains an article on "Pinnacle Topography" with a detailed description of similar landforms in Baker County. This rock mass and the erosional landforms are almost identical to the ones in Grizzly Canyon. I am enclosing a separate sheet with definitions of some of the terms used and also returning the aerial photographs of the Grizzly Canyon area.

If you should need further information be sure to let me know.

NS

Definition of Volcanic Terms

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PYROCLASTIC- a general term applied to detrital volcanic materials that have been explosively or aerially ejected from a volcanic vent. Also, a general term for the class of rocks made up of these materials.

AGGLOMERATE - contemporaneous pyroclastic rock containing a predominance of rounded or subangular fragments greater than 32 mm in diameter.

VOLCANIC BRECCIA - A more or less indurated pyroclastic rock consisting chiefly of accessory and accidental angular ejecta, 32 mm or more in diameter lying in a fine tuff matrix. If the matrix is abundant, the term **TUFF BRECCIA** seems appropriate.

LAHAR OR MUD FLOW - A torrential flow or flood of water saturated volcanic debris down the slopes of a volcano in response to gravitative forces. Lahars are a type of landslide and result when pyroclastic materials resting on the flanks of a volcano become saturated with water and move down-slope as a slide or flow. Mud flows or Lahars are generally unsorted and composed of volcanic materials ranging from fine ash to huge blocks tens of feet in diameter, although some consist essentially of ash or volcanic mud. They may attain thicknesses of several score feet and extend over distances of many miles. Ordinarily it is difficult to distinguish ancient lahars or mud flows.

ASH FLOW TUFF - a deposit of more or less indurated rock resulting from an avalanche of volcanic gases and ash, traveling down the flanks of a volcano or along the surface of the ground and produced by the explosive disintegration of viscous lava in a volcanic crater or by the explosive emission of gas-charged ash from a fissure or a group of fissures.