

Renaming "Quartz Basalts" of Cinder Cone, Lassen Volcanic National Park

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By

KEN CARLSON, Geology Student
California State University, Sacramento

GREG WHEELER, Lecturer
California State University, Sacramento

Photos by Ken Carlson.

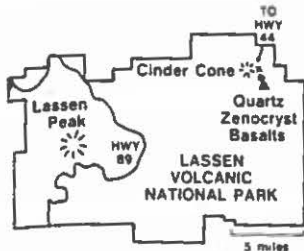
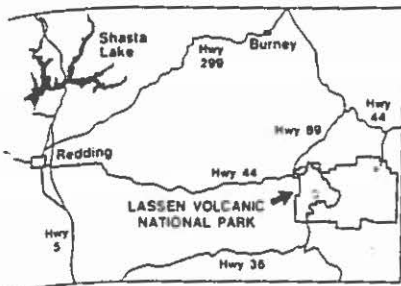


Figure 1. Location of Cinder Cone within Lassen Volcanic National Park.

Cinder Cone is located about 70 miles east of Redding, California (figure 1, photos 1 and 2), in the northeast corner of Lassen Volcanic National Park, a part of the Cenozoic volcanic province of the southern Cascade Mountains. Cinder Cone is approximately 0.8 km (one-half mile) in diameter and 183 m (600 feet) high. The most recent eruptions of Cinder Cone were witnessed by prospectors in 1850 and 1851 (Finch and Anderson, 1930).



Photo 1. Cinder Cone from the north. Summit elevation is 2105 m (6907 feet). Mottled effect on cone sides is due to mass wasting (soil creep).

Previous workers have called the recent flows "quartz basalts" (Diller, 1889; Williams, 1932; and Finch and Anderson, 1930). These lavas are interpreted to be the result of contamination, possibly from a rhyolitic layer through which the magma may have moved (James, 1966). Harbaugh (1975) interprets the "quartz basalts" to be derived from magma mixing; however, he presents no evidence for this

conclusion. Applying the name "quartz basalt" to this rock unit leads to the question: does the name mean a contaminated basalt or a basalt with quartz as an original constituent of the magma?



Photo 2. View to northeast of quartz-xenocryst basalt flows from slopes of Cinder Cone. The flows form part of the "Fantastic Lava Beds" which dam Butte Lake in the middle distance.

PETROGRAPHY

Six samples were studied. The samples have hypocrySTALLINE (partly composed of glass) texture with most of the glass in the groundmass. The plagioclase in the samples is fine grained and splintery. Reaction rims of partially resorbed quartz surrounded by 0.5 - 1 mm pyroxene crystals (figure 2) were observed in two samples. One sample contained pyroxene-lined vugs (figure 3). Some of these vugs may have contained quartz crystals which were plucked during grinding of the thin sections. All samples contain angular quartz inclusions that are much larger than vugs in the rock.

If siliceous waters or a vapor phase intruded the cooled rocks it would have filled all vugs and not been selective. The 1-8 mm angular inclusions suggest rapid chilling after incorporation from wall rock. Quartz inclusions are homogeneous and do not exhibit zonation or geode textures. The distribution, size, shape, texture, and resorbed boundaries of the quartz supports an origin from contamination of the parent basaltic magma by plucking from the wall rock rather than by deposition from siliceous waters or a vapor phase. In view of presented data, it

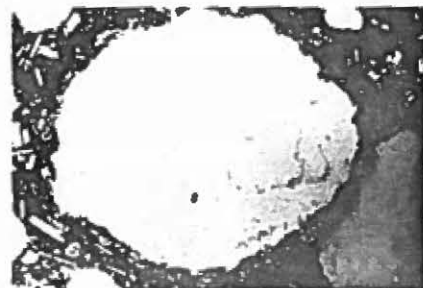


Figure 2. Photomicrograph of quartz-xenocryst basalt. Long dimension = 2.5 mm. Plane light. Faint outline of quartz xenocryst visible in oval-shaped, pyroxene-rimmed vug.

is recommended that the quartz inclusions in basalt at Cinder Cone be referred to as xenocrysts. A more useful name for this rock is "quartz-xenocryst basalt". This name clarifies the exact relationship of quartz to the basalt.

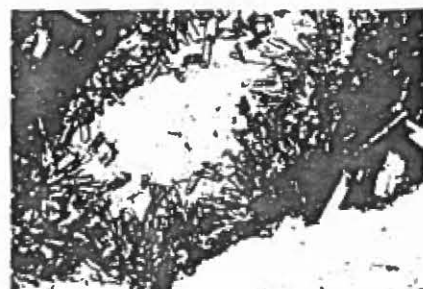


Figure 3. Photomicrograph of a pyroxene-lined vug in plane light. Long dimension = 0.65 mm. The vug may have contained quartz that was plucked during thin section grinding.

REFERENCES

- Diller, J.S., 1889, Geology of the Lassen Park District: U.S. Geological Survey, 8th Annual Report, Part 1, p. 395-432.
- Finch, R.H. and Anderson, C.A., 1930, The quartz basalt eruptions of Cinder Cone, Lassen Volcanic National Park, California: University of California, Department of Geological Sciences Bulletin, v. 19, no. 10, p. 245-273.
- Harbaugh, J.W., 1975, Geology field guide to northern California: Kendall/Hunt Publishing Company, p. 109.
- James, D.E., 1966, Geology and rock magnetism of Cinder Cone lava flows, Lassen Volcanic National Park, California: Geological Society of America Bulletin, v. 77, p. 303-312.
- Williams, H., 1932, Geology of Lassen Volcanic National Park, California: University of California, Department of Geological Sciences Bulletin, v. 21, p. 195-385. ✕