

*FULGURITE IN THE
SIERRA NEVADA*

AN UPDATE

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MAMMOTH LAKES, CALIFORNIA

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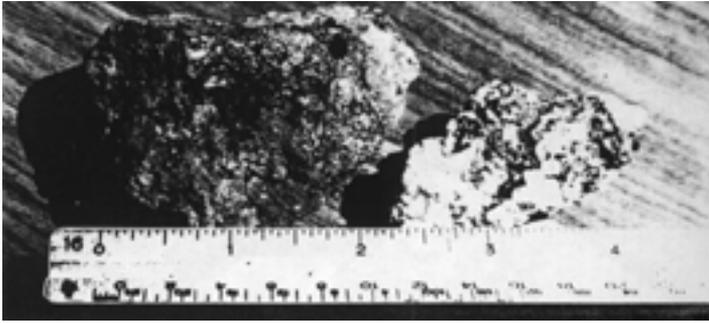
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In the November 1986 issue of CALIFORNIA GEOLOGY the author reported on the occurrence of fulgurites in the Sierra Nevada (Libby, 1986). Fulgurites are a crust-like structure of fused silicate formed by lightning and melted into various substances—in the cases described, the rock of mountain peaks. The peaks previously listed in 1986 were in Sequoia and Kings Canyon National Parks . . . editor



The sharply-pointed summit of Milestone Mountain (13641 feet) attracts frequent lightning strikes, which form fulgurites on the exposed rocks. Photos by C. A. Libby.

During 1986 and 1987, observations of fulgurites were made in widely scattered parts of the Sierra Nevada. Fulgurites were noted on Milestone Mountain, Mount Shinn, Scylla, Mount Humphreys, Volcanic Ridge, Mount Bago, Kearsarge Peak, Dragon Peak, Black Mountain, and Mount Clarence King. Trained observers also reported spotting fulgurites on Mount Morrison (Sheppard and Schweizer, 1986). Milestone Mountain (13641 feet) is a granitic peak on the Great Western Divide of Sequoia National Park, just south of Thunder Mountain. Mount Shinn (11020 feet), another granitic peak, is located in the Sierra National Forest, south of Florence Lake Reservoir. Scylla (12939 feet) is a dark peak of metamorphic origin guarding the head of Enchanted Gorge in Kings Canyon National Park.



A comparison of fulgurite from Oregon (the black, glassy crust on dark volcanic rock, left) and fulgurite from the Sierra Nevada (the light crust on the granite, right). Note the small pit melted (presumably) into the volcanic rock. Scale is in inches.

Mount Humphreys (13986 feet) is a towering granite spire on the Sierra Nevada crest southwest of the town of Bishop. Volcanic Ridge (11501 feet) is in the Minarets area northwest of Mammoth Lakes. Kearsarge Peak (12598 feet) is a granite peak west of Independence. Mount Clarence King (12905 feet), Mount Bago (11868 feet), Dragon Peak (12995 feet), and Black Mountain (13289 feet) are granitic peaks in southern Kings Canyon National Park. Mount Morrison (12268 feet) is an-



Volcanic Ridge (11501 feet) is in the Minarets area northwest of Mammoth Lakes. Fulgurites were found on the ridge in the summer of 1987.



Fulgurites have been observed on the dark, metamorphic summit boulders of Mount Morrison (12268 feet).

other dark metamorphic peak located near the town of Mammoth Lakes.

Milestone Mountain was of particular interest to me, because initially I found no fulgurites on the granite blocks of this summit. During 1986, I discovered them among the rocks of a 6-foot-high, beehive-shaped cairn built by climbers to mark the summit of this majestic mountain. My first thought was that the climbers just happened to stack rock already containing fulgurites. But I noticed that all fulgurites were aligned vertically on various rocks of the cairn. In other words, one could have dropped a plumb line down the cairn and all of the fulgurites would have lined up. Such an arrangement seemed highly unlikely to have occurred in a random stacking. This indicated the exciting possibility that the fulgurites were formed after the cairn was built.

The rare possibility of dating this unusual fulgurite formation reminded me of a study in Atlin, British Columbia. There a lichenologist developed growth rates for certain types of lichens in that climate by measuring their diameters on tombstones in the local graveyard. The headstones, of course, all had exact dates printed on them (Beschel, 1961).

Although there were no dates printed on the cairn rocks, a little research revealed that the first ascent of Milestone Mountain was in July 1912 (Roper, 1976). Therefore, if these fulgurites were indeed formed after the construction of the cairn, they were formed no earlier than 1912.

At this writing, it has not been determined whether the small fulgurite droplets, about a half-inch in diameter, were formed by one or more lightning strikes. Further investigation of sites like Milestone Mountain is needed to unravel this riddle.

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THE EVENT

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