

Not unnaturally the layman's inclination has ever been to appeal to a dramatic, violent cause, to a cataclysm of some kind; for those not versed in the earth sciences find it difficult to believe that so unusual a chasm could have been fashioned by slow everyday processes. Of varied and imaginative conjectures as to the Yosemite's mode of origin, consequently, there has been no lack. Speculation began on the very day, in 1851, when the valley was first entered by white men. Seated around their camp fire on the bank of the Merced, in view of the stupendous cliffs of El Capitan, the rough pioneers composing the historic Mariposa Battalion hazarded the first crude guesses.

Even among scientists there have been more than one to whom the remarkable configuration of the Yosemite Valley has seemed inexplicable save as the result of some paroxysm of nature. It happened, indeed, that the first geologist of note who was in a position to speak authoritatively on the subject, Prof. Josiah D. Whitney, believed in a catastrophic cause, and his belief naturally did much to confirm the prevailing trend of thought. Whitney, as State geologist of California, in 1863 instituted the first scientific exploration of the Sierra Nevada, the great mountain range in which the Yosemite is situated, and as a result of his observations was led to conclude that the valley had been roughly hewn into its present proportions by a dislocation of the earth's crust involving the engulfment of a great block, or group of blocks.¹ In his own homely but expressive phrase, he conceived the bottom of the valley to have dropped out, owing to some convulsive movements within the earth, associated, presumably, with the upheaval of the Sierra Nevada. This hypothesis, having been set forth by Whitney not only in his official report but also in his popular Yosemite guidebook,² which was issued with the approval of the State legislature, became widely accepted as authoritative; and, being simple, plausible, and sensational, it did not fail to make a strong appeal to the popular imagination.

The underlying idea of Whitney's hypothesis was, it should be added in all fairness, not so absurd as some of his opponents have intimated, for there are many well-authenticated instances of valleys that have been created by the subsidence of blocks of the earth's crust. Several such depressions are associated with the Sierra Nevada—notably Owens Valley and the basin occupied by Lake Tahoe. However, Whitney's hypothesis rested on no tangible evidence, and nothing has been found thus far to substantiate it.

Another scientist who believed in a catastrophic origin of the Yosemite was Clarence King, who in the early sixties was one of Whitney's younger assistants on the survey of the Sierra Nevada and who later became chief of the United States Geological Survey

of the Fortieth Parallel and, finally, Director of the United States Geological Survey. King³ conceived the Yosemite to be essentially a "yawning crack" due to the rupturing, or "splitting asunder," of the earth. He was the first to discover the unmistakable evidence of the passage of a glacier through the valley, but though he saw that that glacier had been at least 1,000 feet thick, he ascribed to it only slight influence in the modeling of the valley, for, like the other members of Whitney's staff, he believed glaciers to have inherently small excavating power.

Not long after the pioneer explorations of Whitney and King, however, it became manifest to scientists that the Yosemite Valley, far from being the product of a violent paroxysm of nature, had been evolved little by little, in the course of long periods of time, through the slow "eroding," literally "gnawing" action of streams and glaciers, seconded by the destructive work of rain, frost, and other atmospheric agents.

Prof. William P. Blake, of the University of Arizona, in 1866, was the first to express the belief that the Yosemite like most other valleys and canyons on this earth, is a feature wrought by erosional processes. He regarded it primarily as a stream-worn canyon in whose final shaping a glacier had played a part, but, like other geologists of that time, he was inclined to attribute the remodeling of the chasm to torrents flowing under the glacier rather than to the glacier itself.⁴ Unfortunately he presented this tentative interpretation, as well as the remarkably accurate analysis which he made on a later visit,⁵ to scientific audiences alone, and thus the general public has remained unacquainted with them.

It was John Muir,⁶ the keen student and ardent lover of nature, who first saw clearly that the glaciers themselves had done most of the excavating. Although not a geologist by profession, he was quick to perceive the manifold evidences of powerful glacial action in and about the Yosemite. Fascinated by the story which he read in them, he devoted most of his spare time during his sojourn in the valley in 1869 and the years following to tracing the pathways of the ancient glaciers, and thus the conviction grew upon him that the Yosemite and indeed all the great canyons of the Sierra Nevada are primarily channels gouged out by ice streams. Later, through his charming writings, he disseminated his ideas of glaciation far and wide, thereby uprooting in the minds of many people the primitive belief in a catastrophic origin of the valley.

¹ King, Clarence, *Mountaineering in the Sierra Nevada*, 4th ed., pp. 7, 134, Boston, 1874.

² Blake, W. P., *Sur l'Action des anciens glaciers dans la Sierra Nevada de Californie, et sur l'origine de la vallée de Yosemite*: *Compt. Rend.*, vol. 65, pp. 179-181, 1867.

³ Blake, W. P., *Glacial erosion and the origin of the Yosemite Valley*: *Am. Inst. Min. Eng. Trans.*, vol. 29, pp. 823-835, 1900.

⁴ For a partial list of Muir's writings on the Yosemite Valley, see bibliography, pp. 130-131. A complete bibliography of Muir's writings was published in *Sierra Club Bull.*, vol. 10, pp. 41-54, 1916.

¹ Whitney, J. D., *Geological survey of California*: *Geology*, vol. 1, pp. 421-422, 1865.

² Whitney, J. D., *The Yosemite guidebook*, pp. 84-87, 1870.