Prof. Joseph Le Conte,[7] of the University of California, upon visiting the Yosemite in 1871, was deeply impressed by Muir's interpretations. He also recognized the valley to be an ancient glacier channel, but he differed from Muir in that he attributed a considerable share of the excavation to stream action prior to the coming of the glacier.

Of the controversy that arose between Muir and Whitney little need here be said. Whitney tenaciously clung to his "dropped-block hypothesis" and even denied outright that the Yosemite had ever been invaded by the ice,[8] although he had previously published the indubitable evidence, reported by Clarence King, of the former presence of a glacier in the valley.[9] Muir, on his part, went too far in his claims for glacial erosion. Dominated by the belief that the Sierra Nevada had been mantled with ice "from summit to base" and to a depth sufficient to bury practically all its features,[10] he maintained that the Yosemite and, indeed, all the great canyons of the range, thousands of feet in depth, had been gouged out entirely by the glaciers. These canyons, he asserted, owe not only their general forms but their very "trends and geographical positions" to glacial action.[11] The average depth to which the Sierra had been stripped of rock by the ice he estimated at considerably over a mile.[12]

To many persons, naturally, these statements seemed extravagant. Geologists, especially, were slow to accept them, because of the evident lack of substantiating proof. It is to be borne in mind, also, that at the time when Muir first set forth his views of wholesale glaciation the ice age was still a new and rather vague concept. Little was known of the magnitude which the glaciers and ice sheets have attained in different parts of the earth, nor of the extent to which they have changed the configuration of the lands. The ability of glaciers to excavate deep canyons in hard rock was still regarded as a matter to be demonstrated.

How widely the best informed men of Muir's time differed in their estimates of the excavational work that has been accomplished by the ice in the Yosemite Valley is illustrated by the fact that Prof. Israel C. Russell,[13] of the University of Michigan, in 1889, after having studied the extensive débris ridges, or moraines, which the glaciers descending from the east flank of the Sierra Nevada have built at the mouths of their canyons, declared that in his opinion the absence of similar bulky moraines at the foot of the Yosemite Valley argued strongly against the supposition that that valley had been excavated mainly by glaciers. Though himself a noted student of glaciers, Russell therefore reverted to Whitney's hypothesis for an explanation.

Again, Henry W. Turner, of the United States Geological Survey, upon extending his investigations in the Sierra Nevada southward to the Yosemite Valley in 1899, found it so similar in many respects to certain stream-worn canyons observed by him that he felt convinced that its features could be explained as products largely of stream erosion and weathering processes, facilitated by the jointed structure of the granite. The glaciers, in his opinion, had done little more than clear the valley of loose débris.[14] Turner made the first attempt to determine the farthest limits reached by the Yosemite Glacier and tentatively located these limits in the vicinity of El Portal, only 9 miles below the valley. The relatively modest dimensions of the ice stream thus indicated, together with the small amount of débris it had left behind in the form of moraines, strengthened his conviction that it had had but slight erosive power. On the other hand, he rightly insisted that the upheaval of the Sierra Nevada in preglacial time must have greatly accelerated the flow of the Merced River and caused that stream to intrench itself deeply.

Turner's interpretation of the Yosemite as primarily a stream-cut canyon was, of course, challenged at once by the apostles of glacial erosion, notably by Henry Gannett, then chief geographer of the United States Geological Survey. Gannett, as a result of his studies on Lake Chelan, in the Cascade Range, had come to regard "hanging" side valleys as characteristic accessory features of deeply glaciated canyons, and contended that the height of such valleys affords a rough measure of the depth of glacial excavation in the main canyon. The Yosemite, he pointed out, has hanging side valleys of great height (the upland valleys from whose mouths the waterfalls pour into the chasm), and he therefore pronounced it to be "quite an ordinary and necessary product of glacial erosion." [15]

Prof. John C. Branner, of Leland Stanford Junior University, on the other hand, stood by Turner, and on the strength of his cursory observations concluded that in the Yosemite Valley "the wearing done by the ice was trivial as compared with the wearing done by the glacial streams." [16]

Several other scientists have since advanced tentative hypotheses in explanation of the Yosemite's origin, each based, however, on only a brief examination. All of them, significantly, assign a large share of the excavational work to glacial action, but they differ

[7] Le Conte, Joseph, A journal of ramblings through the High Sierra of California by the University excursion party, San Francisco, Calif., 1875 (republished as Ramblings through the High Sierra: Sierra Club Bull., vol. 3, pp. 1–107, 1900).

[8] Whitney, J. D., The Yosemite guidebook, pp. 83–84, 1870.

[9] Whitney J. D., Geological survey of California; Geology, vol. 1, p. 422, 1865.

[10] Muir, John, Studies in the Sierra—IV, Glacial denudation: Sierra Club Bull., vol. 10, p. 316, 1918 (reprinted from Overland Monthly, vol. 13, pp. 174–184, 1874).

[11] Idem, p. 308.

[12] Idem, p. 318.

[13] Russell, I. C. Quaternary history of Mono Valley, Calif.: U. S. Geol. Survey Eighth Ann. Rept., pt. 1, p. 350, 1889.

[14] Turner, H. W., The Pleistocene geology of the south-central Sierra Nevada, with especial reference to the origin of Yosemite Valley: California Acad. Sci. Proc., 3d ser., vol. 1, pp. 319–320, 1900.

[15] Gannett, Henry, Origin of Yosemite Valley: Nat. Geog. Mag., vol. 12, pp. 86–87, 1901.

[16] Branner, J. C., A topographic feature of the hanging valleys of the Yosemite: Jour. Geology, vol. 11, p. 551, 1903.