

unique type of scenery. Cliffs absolutely vertical, like the upper portions of the Half Dome and El Capitan, and of such immense heights as these, are, so far as we know, to be seen nowhere else. The dome form of mountains is exhibited on a grand scale in other parts of the Sierra Nevada; but there is no Half Dome, even among the stupendous precipices at the head of King's River. It is natural to ask, then, how these vertical cliffs have been formed, and to what geological causes does the Yosemite Valley owe its existence?

Most of the great cañons and valleys of California have resulted from denudation, as has been already repeatedly stated in the course of this volume. The long-continued action of the tremendous torrents of water, rushing with impetuous velocity down the slopes of the Sierra, has excavated those prodigious gorges, by which the chain is furrowed to the depth of thousands of feet. But these eroded cañons, steep as they may be, have not vertical walls; neither have their sides the peculiar angular forms which the mass of El Capitan, for instance, has, where there are two perpendicular surfaces of smooth granite meeting at right-angles; and each over 3000 feet high.

When Messrs. Gardner and King's map of the Yosemite is published, and farther investigations made to clear up some doubtful points, the theory of the formation of this valley may be discussed more intelligibly than it can be at present. It may, however, be stated, that it appears to us probable that this mighty chasm has been roughly hewn into its present form by the same kind of forces which have raised the crest of the Sierra and moulded the surface of the mountains into something like their present shape. The domes, and such masses as that of Mount Broderick, we conceive to have been formed by the process of upheaval itself, for we can discover nothing about them which looks like the result of ordinary denudation. The Half Dome seems, beyond a doubt, to have been split asunder in the middle, the lost half having gone down in what may truly be said to have been "the wreck of matter and the crush of worlds." It has been objected to this view, by some of the corps, that the bottom of the valley, in places where an engulfment must, according to this theory, have taken place, seems to be of solid granite, when there should be an unfathomable chasm, filled now, of course, with fragments, and not