conical hill. But volcanic cinders or ashes are often carried by the winds to great distances, and when abundant, make extensive deposits with horizontal bedding; and such deposits may, in extreme cases, reach a thickness of hundreds of feet and bury forests.

Where small cones have been mostly removed to their base, they may show a central cone of lava — the lava that in its active state was the source of the ashes, and around it more or less of the ejected ashes or lava. Such places have been called "volcanic necks."

(*d*) *The earlier lava-streams of a great volcano much thicker than the later.* — On going up the valleys of Tahiti (Fig. 161), the thickness of the lava-streams was found by the author to increase from 10, 20, and 30 feet along the coast to 500 and 1000 feet, five or six miles in the interior; and in Kauai, of the Hawaiian group, the same general fact proved to be true. These great volcanoes appear to have poured lavas out copiously at their commencement, and to be now in a greatly dwindled condition. In what geological period the Tahitian and Hawaiian volcanoes began to flow is unknown.

(*e*) *The interior of the volcanic mountain before and after extinction.* — In times of activity, a great volcanic mountain has within it a column of liquid lavas, the lava-conduit, which may be two, three, or more miles in diameter. During the long period of activity the heat of the column spreads far into the adjacent cooled lavas, occasioning in them a more coarsely crystalline condition than that of the modern lava-stream.

At the extinction of the volcano, if the ascensive force continued to hold the summit of the lava-column to its high position, the enormous liquid mass would have cooled with extreme slowness, and become throughout more or less crystalline. The nearly vertical face of the central peak of Tahiti, 3000 feet or more in height, as seen by the author from a summit near by (page 180), was found to be without any trace of layers; it was just such a continuous mass from the top down, as the cooling of a lofty, central lava-mass would have made. And rounded stones of a coarsely crystalline granite rock, found along the bed of the stream six to eight miles up one of the valleys, appeared to be evidence as to the crystalline structure of the central peak, sustaining the principle as to the connection of grade of crystallization with rate of cooling. (D., 1839.)

Extinction is a consequence of a withdrawal of heat, or failure of the ascensive action. But the circumstances attending it may be various. A general collapse or down plunge of the summit at the eruption may leave a crater 2000 feet deep, as in the case of Haleakala in east Maui, or a collapse may fail to take place at the final eruption, through a gradual decline of heat within, and the mountain hence be left without a visible crater, as is true of Mount Kea. E. D. Preston has proved, by gravity determinations with the pendulum, that Haleakala below its crater is solid, the gravity found being 2·7, and that Kea in its upper part, giving 2·1, is hollow. The same evidence has indicated that the volcanic mountains of Ascension Island, St. Helena, and Fujiyama in Japan, are hollow, — densities of 1·6, 1·9, and 2·1 having been found severally for the masses of these mountains; and by the deviation of the plumb-line of only 7 or 8 seconds by Chimborazo, it is believed to be indicated that this mountain also is hollow. Preston obtained for the lower