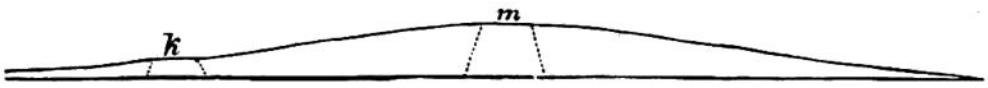
soon made it evident that it was produced out of the falling blocks by the lifting of the bottom owing to the ascensive action of the lavas beneath, like Lyman's ridge described on page 284. (F. S. Dodge.)

The recent eruptions of Mount Loa, the summit crater, have been vastly more extensive than those of Kilauea. Situated topographically within the same mountain mass, as the following diagram (Fig. 248) shows, the two have yet gone on with their preparations and eruptions simultaneously, but in general independently; the loftier crater unaffected in its lifting and its eruptive forces by the great opening at the lower level. Kilauea has none of the virtues of a safty-valve for Mount Loa, though probably as much of a safety-valve for the mountain as any volcanic vent ever is. The recent eruptions of Mount Loa occurred in the years 1843, 1852, 1855, 1859, 1868, 1880, 1887; and excepting the two on the southern slopes, those of 1868 and 1887, the place of outbreak was at heights of 10,500 to 13,000 feet, and the lengths of the streams 20 to 35 miles. At the place of outbreak in several instances, there have been great fountains of lava, 300 to 700 feet in height,

248.



Section of Mount Loa and Kilauea.

that played for a few days, as the stream gushed forth — a consequence either of the projectile force of escaping vapors, or of hydrostatic pressure from the lavas in the Mount Loa lava-column, or from both causes combined. In contrast with Mount Loa, the famous Hecla of Iceland, about 5000 feet in height, has had only five eruptions since 1700, viz., in 1728, 1754, 1766, 1845, 1878.

(*c*) *Earthquakes not an essential feature of volcanic eruptions.* — The great eruptions of Mount Loa, excepting those of 1868 and 1887, have been unattended by noticeable earthquakes. The rupturings must have caused vibrations, but they have usually been unperceived at the villages of the island. "A fire on the mountain" has been the first announcement of the outbreak. When the outflow has begun, the liquid lava in the bottom of the summit crater has disappeared, and the crater has lost at the same time its activity.

In 1868 and 1887, however, there were violent earthquakes; but otherwise the circumstances were not different. In 1887, two days intervened between the appearance and fading of the light at the summit and the exit of the lavas, and, in 1868, four days, owing apparently to the distance of the place from the discharging conduit; but when once out the lavas rose into a fountain of 100 to 200 feet, showing that they were under great pressure, and then the shakings ceased. At the eruption of 1868, Kilauea was discharged at the same time as Mount Loa, — Mount Loa forces evidently producing this remarkable result by breaking first the Mount Loa conduit, and then four days later, before the earthquakes ceased, that of Kilauea. In other words, the fracturing of the mountain made by vapors generated by the Mount Loa fires finally extended to the Kilauea conduits.