

would be still greater, the whole top of the mountain, or a large part of it, might fall in.

Instances of such truncations, however caused, have occurred in Java and in the Andes within the times of history, and to such events we may perhaps refer a very common feature in the configuration of volcanic mountains,—namely, that the present active cone of eruption is surrounded by the ruins of a larger and older cone, usually presenting a crescent-shaped precipice towards the newer cone. In volcanoes long since extinct, the erosive power of running water, or, in certain cases, of the sea, may have greatly modified the shape of the “atrium,” or space between the older and newer cone, and the cavity may thereby be prolonged downwards, and end in a ravine. In such cases it may be impossible to determine how much of the missing rocks has been removed by explosion at the time when the original crater was active, or how much by subsequent engulfment and denudation.

Java.—One of the latest contributions to our knowledge of volcanoes will be found in Dr. Junghuhn's work on Java, where forty-six conical eminences of volcanic origin, varying in elevation from 4000 to nearly 12,000 feet above the sea, constitute the highest peaks of a mountain range, running through the island from east to west. All of them, with one exception, did this indefatigable traveller survey and map. In none of them could he discover any marine remains, whether adhering to their flanks or entering into their internal structure, although strata of marine origin are met with nearer the sea at lower levels. Dr. Junghuhn ascribes the origin of each volcano to a succession of sub-aerial eruptions from one or more central vents, whence scoriæ, pumice, and fragments of rock were thrown out, and whence have flowed streams of trachytic or basaltic lava. Such overflowings have been witnessed in modern times from the highest summits of several of the peaks. The external slope of each cone is generally greatest near its apex, where the volcanic strata have also the steepest dip, sometimes attaining angles of 20, 30, and 35 degrees, but becoming less and less inclined as they recede from the summit, until, near their base, the dip is reduced to 10 and often 4 or 5 degrees.* The interference of the lavas of adjoining volcanoes sometimes produces elevated platforms, or “saddles,” in which the layers of rock may be very slightly inclined. At the top of many of the loftiest mountains the active cone and crater are of small size, and surrounded by a plain of ashes and sand, this plain being encircled in its turn by what Dr. Junghuhn calls “the old crater-wall,” which is often 1000 feet and more in vertical height. There is sometimes a terrace of intermediate height (as in the mountain called Tengger), comparable to the “black ledge” of Kilauea (fig. 641). Most of the spaces thus bounded by semicircular or more than semicircular ranges of cliffs are vastly superior in dimensions to

* *Java, deszelfs gedaante, bekleeding en invendige structuur, door F. Junghuhn.* (German translation of 2d edit. by Hasskarl, Leipzig, 1852.)