

sible even during periods of eruption. It is impossible, without an exact representation of the configuration—the normal type, as it were, of fire-emitting mountains, to form a just idea of those phenomena which, owing to fantastic descriptions and an undefined phraseology, have long been comprised under the head of *craters*, *cones of eruption*, and *volcanoes*. The marginal ledges of craters vary much less than one would be led to suppose. A comparison of Saussure's measurements with my own yields the remarkable result, for instance, that in the course of forty-nine years (from 1773 to 1822), the elevation of the northwestern margin of Mount Vesuvius (*Rocca del Palo*) may be considered to have remained unchanged.*

Volcanoes which, like the chain of the Andes, lift their summits high above the boundaries of the region of perpetual snow, present peculiar phenomena. The masses of snow, by their sudden fusion during eruptions, occasion not only the most fearful inundations and torrents of water, in which smoking scorix are borne along on thick masses of ice, but they likewise exercise a constant action, while the volcano is in a state of perfect repose, by infiltration into the fissures of the trachytic rock. Cavities which are either on the declivity or at the foot of the mountain are gradually converted into subterranean reservoirs of water, which communicate by numerous narrow openings with mountain streams, as we see exemplified in the highlands of Quito. The fishes of these rivulets multiply, especially in the obscurity of the hollows; and when the shocks of earthquakes, which precede all eruptions in the Andes, have violently shaken the whole mass of the volcano, these subterranean caverns are suddenly opened, and water, fishes, and tuffaceous mud are all ejected together. It is through this singular phenomenon† that the inhabitants of the highlands of Quito became acquainted with the existence of the little cyclopic fishes, termed by them the *preñadilla*. On the night between the 19th and 20th of June, 1698, when the summit of Carguairazo, a mountain 19,720 feet in height, fell in, leaving only two huge masses of rock remaining of the ledge of the crater, a space of nearly thirty-two square miles was overflowed and devastated by streams of liquid tufa and argillaceous mud (*lodazales*), containing large quantities of dead fish.

* See the ground-work of my measurements compared with those of Saussure and Lord Minto, in the *Abhandlungen der Akademie der Wiss. zu Berlin* for the years 1822 and 1823.

† *Pimelodes cyclopus*. See Humboldt, *Recueil d'Observations de Zoologie et d'Anatomie Comparée*, t. i., p. 21-25.