HEAT.

to a height of only 8 or 10 yards, as in Kilauea, — a height so small that the projected drops or masses of lava fall back unsolidified, and the jets dance in a lively and brilliant way over the surface of the lava-basin. The scene is a brilliant one, when a lake of lava 500,000 square feet in area is covered throughout with the playing jets, as at Kilauea in 1840.

It is a mark also of such extreme liquidity, that where the escaping vapors throw up the lavas in half-covered places under the rocky sides of a lake, the lavas in the recoil dash out in fiery spray much like the spattering of breaking waves. In the pulling apart of the rising lava-jet dividing it into drops, the glassy material in fusion is drawn out into hairs, and forms the "Pele's hair" of Kilauea.

In cases, outside of the lava-lakes, where the bubbles are bursting beneath an opening in the bottom of the crater, the vapors and lava driblets escape from the aperture with a rush and a roar, "as if all the steam engines of the world were concentrated in it." (Douglas.) The driblet-cone, thus made, is sometimes called a *blowing-cone*.

Now and then the regular ebullition is interrupted by larger throws, even to 200 feet. At other times the lake becomes crusted over with a glassy scum, or with a crust of more solid lava, and so remains for a while; and then — at intervals of minutes, or hours, e-longer — it breaks anew into activity, attended with a remelting of what had solidified, and the throwing up of jets as before.

In the Mount Loa crater, situated 13,675 feet above the sea (10,000 feet above Kilauea), the jets generally rise 200 feet or more, and instead of the quiet ebullition of Kilauea there is the play of a great fiery fountain. One of the describers states that in 1873 the "fountain of fire," 150 feet broad, played in several united but independent jets to a height of 150 to 300 feet. At one time the jets suddenly became low, and continued thus for a few seconds, then "with a roar like the sound of gathering waters, nearly the whole surface of the lake was lifted up, and its whole radiant mass rose three times in one outburst to a height, as estimated by the surrounding cliffs, of 600 feet. After this the fountain played as before with jets of 300 (I. L. Bird, 1876.) Others report heights of 600 to 800 feet in the feet." These are the conditions in the Mount Loa crater only playing fountains. when eruptions are imminent.

The cause of this high projection of the lavas in fountain-like form in a summit crater can be no other than the escaping vapors; and the difference between such fountains and the gentler ebullition of Kilauea must depend on their amount and rate of supply. Such moisture, if *the deep subterranean region of lavas* were its source, would be most abundant in the equally large but 10,000 feet lower crater, Kilauea. But if supplied by the fresh waters from the rains over the region, the 10,000 feet of greater altitude are a sufficient reason for the difference.

The idea was put forth by Scrope that the fusion in the lavas of a volcano was aqueoigneous fusion, or a mobility due in part to the water-vapor present. Such vapor must increase the liquidity, but facts show that it is not dependent on it. The white light which the lavas of Kilauea often display in their "ebullition" is evidence of heat sufficient for fusion. Bartoli, on Etna in 1893, found the temperature of a lava stream, at its exit, 1910° F.