with violence, and only appear when the volcano becomes more energetic. Thus, at the constantly, but quietly, active volcano of Stromboli, the column of lava in the pipe may be watched rising and falling with a slow rhythmical movement. At every rise, the surface of the lava swells up into blisters several feet in diameter, which by and by burst with a sharp explosion that makes the walls of the crater vibrate. A cloud of steam rushes out, carrying with it hundreds of fragments of the glowing lava, sometimes to a height of 1200 feet. It is by the ascent of steam through its mass, that a column of lava is kept boiling at the bottom of the crater, and by the explosion of successive larger bubbles of steam, that the various bombs, slags, and fragments of lava are torn off and tossed into the air. It has often been noticed at Vesuvius that each great concussion is accompanied by a huge ball-like cloud of steam which rushes up from the crater. Doubtless it is the sudden escape of that steam which causes the explosion.

The varying degree of liquidity or viscosity of the lava probably modifies the force of explosions, owing to the different amounts of resistance offered to the upward passage of the absorbed gases and vapors. Thus explosions and accompanying scoriæ are abundant at Vesuvius, where the lavas are comparatively viscid; they are almost unknown at Kilauea, where the lava is remarkably liquid.

In tranquil conditions of a volcano, the steam, whether collecting into larger or smaller vesicles, works its way upward through the substance of the molten lava, and as the elasticity of this compressed vapor overcomes the pressure of the overlying lava, it escapes at the surface, and there the lava is thus kept in ebullition. But this comparatively quiet operation, which may be watched within the craters