of 20 miles, but 10,000 feet lower, the huge crater Kilauea. As Dana has pointed out, these orifices form part of one mountain, yet the column of lava stands 10,000 feet higher in one conduit than in the other. On a far smaller scale the same independence occurs among the several pipes of some of the geysers in the Yellowstone region of North America.

From the wide extent of basalt-dikes, such as those of Tertiary age in Britain, which rise to the surface at a distance of 200 miles from the main remnants of the volcanic outbursts of their time, and are found over an area of perhaps 100,000 square miles, it is evident that molten lava may sometimes occupy a far greater space within the crust than might be inferred from the dimensions and outpourings even of the largest volcanic cone. There can be no doubt that vast reservoirs of melted rock, impregnated with superheated vapors, must formerly have existed, if they do not exist still, beneath extensive tracts of country (p. 967). Yet even in these more stupendous manifestations of volcanism, the lava should be regarded rather as the sign than as the cause of volcanic action. The cause of the ascent of the lava in volcanic pipes is still obscure: it may possibly be due to the compression arising from the secular contraction of the earth. But it is doubtless the pressure of the imprisoned vapor, and its struggles to get free, which produce the subterranean earthquakes and the explosions from the vents. As soon as the vapor finds relief, the terrestrial commotion calms down again, until another accumulation of vapor demands a repetition of the same phenomena.

Rate of flow of Lava.—The rate of movement is regulated by the fluidity of the lava, by its volume, and by the form and inclination of the ground. Hence, as a