

fissures on a volcanic cone, it may sometimes approach the surface in them without actually flowing out. The great fissure on Etna in 1669, for example, was visible even from a distance, by the long line of vivid light which rose from the incandescent lava within. Again, it frequently happens that minor volcanic cones are thrown up on the line of a fissure, either from the congelation of the lava round the point of emission, or from the accumulation of ejected scorixæ round the fissure-vent. One of the most remarkable examples of this kind is that of the Laki fissure in Iceland, the whole length of which (12 miles) bristles with small cones and craters almost touching each other.<sup>48</sup>

**Explosions.**—Apart from the appearance of visible fissures, volcanic energy may be, as it were, concentrated on a given point, which will usually be the weakest in the structure of that part of the terrestrial crust, and from which the solid rock, shattered into pieces, is hurled into the air by the enormous expansive energy of the volcanic vapors.<sup>49</sup> This operation has often been observed in volcanoes already formed, and has even been witnessed on ground previously unoccupied by a volcanic vent. The history of the cone of Vesuvius brings before us a long series of such explosions, beginning with that of A.D. 79, and coming down to the present day (Fig. 45). Even now, in spite of all the lava and ashes poured out during the last eighteen centuries, it is easy to see how stupendous must have been that earliest explosion, by which the southern half of the ancient crater was blown out. At every suc-

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<sup>48</sup> A. Helland, "Lakis Kratere og Lava-ströme," cited on p. 345. On this straight fissure some 500 craters rise, varying from 5 to 450 feet high.

<sup>49</sup> See Daubrée's experiments on the mechanical effects of gas at high pressures, *Comptes Rend.* cxi., cxii. cxiii. and *Bull. Soc. Geol. France*, xix. (1891), p. 313.