has suggested that, by measuring the temperature of intrusive masses of igneous rock in coal-workings and elsewhere, and comparing it with that of other non-volcanic rocks in the same regions, we might obtain data for calculating the time which has elapsed since these igneous sheets were erupted (*ante*, p. 94).

Effects of lava-streams on superficial waters and topography.—In its descent, a stream of lava may reach a water-course, and, by throwing itself as an embankment across the stream, may pond back the water and form a lake. Such is the origin of the picturesque Lake Aidat in Auvergne. Or the molten current may usurp the channel of the stream, and completely bury the whole valley, as has happened again and again among the vast lava-fields of Iceland. Few changes in physiography are so rapid and so enduring as this. The channel which has required, doubtless, many thousands of years for the water laboriously to excavate, is sealed up in a few hours under 100 feet or more of stone, and another vastly protracted interval may elapse before this newer pile is similarly eroded.[85]

By suddenly overflowing a brook or pool of water, molten lava sometimes has its outer crust shattered to fragments by a sharp explosion of the generated steam, while the fluid mass within rushes out on all sides.[86] The lava emitted by Mauna Loa, Hawaii, in the spring of 1868 flowed out to sea, and added half a mile to the extent of

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[85] For an example of the conversion of a lava-buried river-bed into a hill-top by long-continued denudation, see Quart. Journ. Geol. Soc. 1871, p. 303.

[86] Explosions of this nature have been observed on Etna, where the lava has suddenly come in contact with water or snow, considerable loss of life being sometimes the result. Sartorius von Waltershausen and A. von Lasaulx, "Der Aetna," i. pp. 295, 300.