

to the constant cooling and contraction of the globe.⁴⁸ But it may be replied that these variations are not greater than, from the known divergences in the conductivities of rocks, they might fairly be expected to be.

Probable Condition of the Earth's Interior.—Various theories have been propounded on this subject. There are only three which merit serious consideration. (1.) One of these supposes the planet to consist of a solid crust and a molten interior. (2.) The second holds that, with the exception of local vesicular spaces, the globe is solid and rigid to the centre. (3.) The third contends that while the mass of the globe is solid, there lies a liquid substratum beneath the crust.

1. *The arguments in favor of internal liquidity* may be summed up as follows. (a.) The ascertained rise of temperature inward from the surface is such that, at a very moderate depth, the ordinary melting-point of even the most refractory substances would be reached. At 20 miles the temperature, if it increases progressively, as it does in the depths accessible to observation, must be about 1760° Fahr.; at 50 miles it must be 4600°, or far higher than the fusing-point even of so stubborn a metal as platinum, which melts at 3080° Fahr.⁴⁹ (b.) All over the world volcanoes exist from which steam and torrents of molten lava are from time to time erupted. Abundant as are the active volcanic vents, they form but a small proportion of the whole which have been in operation since early geological time. It has been inferred, therefore, that these numerous funnels of commu-

⁴⁸ "Volcanic Energy," Phil. Trans. 1875.

⁴⁹ But Lord Kelvin (Sir W. Thomson) has shown that if the rate of increase of temperature is taken to be 1° for every 51 feet for the first 100,000 feet, it will begin to diminish below that limit, being only 1° in 2550 feet at 800,000 feet, and then rapidly lessening. Trans. Roy. Soc. Edin. xxiii. p. 163.