

eruption. Some years ago a bed of ice was discovered on the slope of *Ætna*, buried beneath a stream of lava; and from this the city of Catania has since obtained supplies of ice. On *Tierra del Fuego* ice and lava are found interstratified for a great depth—each winter's snow being covered by a new lava-sheet. In 1860 the crater of the mountain *Kutlagaya*, in Iceland, hurled out simultaneously into the air lumps of lava and of ice, all intermingled together.

These are interesting facts, but I propose for them no other use at present than to show some possible reasons why the rate of increase is unequal at different localities or different depths. We know that some regions have been overlaid by sheets of snow and ice. We have also discovered reasons for believing that our northern States, as far as the bowlders are distributed, were covered by continental glaciers during a geological period. If this was so, it may be that their cooling influence is still left within the earth; and if it is, the rate of increase of temperature as observed is lower than it would be under normal conditions. A more rapid rate of increase implies a thinner crust of solid matter. But, while these considerations must not be forgotten, it must be confessed that most of the questions concerning internal heat are still imperfectly understood.

Though we are certain intense internal heat exists, we neither know at what depth it exists, at what ratio it increases, nor what is its cause or source. Nor do we know whether the deep interior is in a solid or a liquid state.

As to the cause of the heat, two principal theories are held. The first conceives the internal heat to be the residual heat of a cooling and once molten globe. (Talks, XXXVII and XXXVIII). The earth is evidently cooling. The records of past volcanic action prove that heat has escaped in enormous quantities from the interior. Thousands of cubic miles of molten lava now solidified over the surface, imply some reduction of the earth's temperature, and the problem is one which might be solved. The traces of former intense action at the surface are retained also in enormous rock formations which