and the atmosphere influences the temperature of the ground only to a limited depth below the surface. It was determined during the eighteenth century that external influences are perceptible only within depths of about 30 feet, or as far down as 80 feet, according to the geographical position of the locality. At the so-called "neutral" zone, or critical horizon of depth, there is a constant temperature which practically corresponds with the average annual temperature of the particular place. Below this zone of constant temperature, the temperature increases in mines, and the increase can only be attributed to the earth's own heat. This increase of temperature had already been noted by Kircher and Boyle in the seventeenth century, but it was not until 1740 that definite observations were made by Gensanne in the lead-mines of Giromagny in the Vosges. Gensanne's result demonstrated an increase of 1° C. for 114 feet of depth. Measurements were made in 1790 and 1791 in the Freiberg mines by Freiesleben and Alexander von Humboldt; Lean took observations in the Cornwall mines, Fantonetti in Italian mines, and Alexander von Humboldt in South American and Mexican mines. All these observations were based upon the temperature of the air in the mines. But, as it was pointed out by Cordier and Reich, this temperature is influenced by air currents, by the mining work, and by the breath of the miners and of animals. Cordier and Reich then placed the thermometer in the rock itself, and taking necessary precautions for correction of experiments, arrived at results of a more reliable character. Cordier reports from French mines an average increase of temperature of 1° C. for 25 mètres (*circa* 77 feet), while Reich reports grades of 41.84 mètres (*circa* 129 feet).

Since 1828, temperature observations have been continuously taken in the mines of Saxony and Prussia, and these yield an average of 1° C. for 167 feet, but as the variations range from 48 to 355 feet, it is impossible to draw any definite law. In England, the British Association for the Advancement of Science about twenty years ago appointed a special commission for investigations of the ground temperatures, and the relative capacities of heat conduction shown by different rocks. A great number of observations have also been contributed by other lands, but as yet no definite results have been obtained. The ground-borings made in various countries have afforded a means of taking observations on the increase