Central heat.—The hypothesis of internal fluidity calls for the more attentive consideration, as it has been found that the heat in mines augments in proportion as we descend. Observations have been made, not only on the temperature of the air in mines, but on that of the rocks, and on the water issuing from them. The mean rate of increase, calculated from results obtained in six of the deepest coal mines in Durham and Northumberland, is 1° Fahr. for a descent of forty-four English feet.* A series of observations, made in several of the principal lead and silver mines in Saxony, gave 1° Fahr. for every sixty-five feet. In this case, the bulb of the thermometer was introduced into cavities purposely cut in the solid rock at depths varying from two hundred to above nine hundred feet. But in other mines of the same country, it was necessary to descend thrice as far for each degree of temperature.†

A thermometer was fixed in the rock of the Dolcoath mine, in Cornwall, by Mr. Fox, at the great depth of 1380 feet, and frequently observed during eighteen months; the mean temperature was 68° Fahr., that of the surface being 50°, which gives 1° for every seventy-five feet.

Kupffer, after an extensive comparison of the results in different countries, makes the increase 1° F. for about every thirty-seven English feet.‡ M. Cordier announces, as the result of his experiments and observations on the temperature of the interior of the earth, that the heat increases rapidly with the depth; but the increase does not follow the same law over the whole earth, being twice or three times as much in one country as in another, and these differences are not in constant relation either with the latitudes or longitudes of places.§ He is of opinion, however, that the increase would not be overstated at 1° Cent. for every twenty-five metres, or about 1° F. for every forty-five feet.‖ The experimental well bored at Grenelle, near Paris, gave about 1° F. for every sixty English feet, when they had reached a depth of 1312 feet.

Some writers have endeavoured to refer these phenomena (which, however discordant as to the ratio of increasing heat, appear all to point one way) to the condensation of air constantly descending from the surface into the mines. For the air under pressure would give out latent heat, on the same principle as it becomes colder when rarified in the higher regions of the atmosphere. But, besides that the quantity of heat is greater than could be supposed to flow from this source, the argument has been answered in a satisfactory manner by Mr. Fox, who has shown, that in the mines of Cornwall the ascending have generally a higher temperature than the descending aërial currents. The difference between them was found to vary

* Ed. Journ. of Sci., April, 1832.

† Cordier, Mém. de l'Instit. tom. vii.

‡ Pog. Ann. tom. xv. p. 159.

§ See M. Cordier's Memoir on the Temperature of the Interior of the Earth, read to the Academy of Sciences, 4th June, 1827.—Edin. New Phil. Journal, No. viii. p. 273.

‖ Cordier, Mém. de l'Instit. tom. vii.