tween the solid crust and the solid nucleus, while others have suggested that the observed subsidence may have been caused, or at least aggravated, by the escape of vapors from volcanic orifices. But with modifications, the main cause of terrestrial movements is still sought in secular contraction.

Some observers, following an original suggestion of Babbage,[934] have supposed that upheaval and subsidence, together with the solidification, crystallization, and metamorphism of the layers of the earth's crust, may have been in large measure due to the deposition and removal of mineral matter on the surface. There can be no doubt that the lines of equal internal temperature (isogeothermal lines) for a considerable depth downward, follow approximately the contours of the surface, curving up and down as the surface rises into mountains or sinks into plains. The deposition of a thousand feet of rock will, of course, cause a corresponding rise in the isogeotherms, and if we assume the average rise of temperature to be 1° Fahr. for every 50 feet, then the temperature of the crust immediately below this deposited mass of rock will be raised 20°. But masses of sediment of much greater thickness have been laid down, and we may admit that a much greater increase of temperature than 20° has been effected by this means. On the other hand, the denudation of the land must lead to a depression of the isogeotherms, and a consequent cooling of the upper layers of the crust.

It may be conceded that in so far as the internal structure of rocks may be modified by such progressive increase of temperature as would arise from superficial deposit, this

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[934] Journ. Geol. Soc. iii. (1834), p. 206.