

present dissociation of the axis of rotation from the magnetic poles, and with changes of climate, have attracted some attention,¹ and probably deserve further consideration on the part of physicists. In so far as geological evidence is concerned, it would seem that the general association of crumpling with metamorphism indicates a certain rapidity in the process of mountain-making, and consequent development of heat; and the arrangement of the older rocks around the Arctic basin forbids us from assuming any extensive movement of the axis of rotation, though it does not exclude changes to a limited extent.

(8) It appears from the above that mountains and continental elevations may be of three kinds. (a) They may consist of material thrown out of volcanic rents, like earth out of a mole burrow. Mountains like Vesuvius and Ætna are of this kind. (b) They may be parts of wide ridges or chains variously cut and modified by rains and rivers. The Lebanon and the Catskill Mountains are cases in point. (c) They may be lines of crumpling by lateral pressure. The greatest mountains, like the Cordillera, the Alps, and the Appalachians are of this kind, and such mountains may represent lateral pressure occurring at various times, and whose results have been greatly modified subsequently.

I wish to formulate these principles as distinctly as possible, and as the result of all the long series of observations, calculations, and discussions since the time of Werner and Hutton, and in which a vast number of able physicists and naturalists have borne a part, because they may be considered as certain deductions from our actual knowledge, and because they lie at the foundation of a rational physical geology.

We may roughly popularise these deductions by comparing the earth to a drupe or stone-fruit, such as a plum or peach

¹ See recent papers of Oldham and Fisher, in *Geological Magazine*, and *Philosophical Magazine*, July, 1886. Also Péroche, "Revol. Polaires." Paris, 1886.