

In taking a general view of the geological constitution of a chain of mountains, we may distinguish five elements of direction too often confounded in works of geognosy and physical geography. These elements are:—

1. The longitudinal axis of the whole chain.
2. The line that divides the waters (*divortia aquarum*).
3. The line of ridges or elevation passing along the maxima of height.
4. The line that separates two contiguous formations into horizontal sections.
5. The line that follows the fissures of stratification.

This distinction is the more necessary, there existing probably no chain on the globe that furnishes a perfect parallelism of all these directing lines. In the Pyrenees, for instance, 1, 2, 3, do not coincide, but 4 and 5 (that is, the different formations which come to light successively, and the direction of the strata) are obviously parallel to 1, or to the direction of the whole chain. We find so often in the most distant parts of the globe, a perfect parallelism between 1 and 5, that it may be supposed that the causes which determine the direction of the axis (the angle under which that axis cuts the meridian), are generally linked with causes that determine the direction and inclination of the strata. This direction of the strata is independent of the line of the formations, or their visible limits at the surface of the soil; the lines 4 and 5 sometimes cross each other, even when one of them coincides with 1, or with the direction of the longitudinal axis of the whole chain. The *relief* of a country cannot be precisely explained on a map, nor can the most erroneous opinions on the locality and superposition of the strata be avoided, if we do not apprehend with clearness the relation of the directing lines just mentioned.

In that part of South America to which this memoir principally relates, and which is bounded by the Amazon on the south, and on the west by the meridian of the Snowy Mountains (*Sierra Nevada*) of Merida, the different bands or zones of formations (4) are sensibly parallel with the longitudinal axis (1) of the chains of mountains, basins, or interposed plains. It may be said in general that the granitic zone (including under that denomination the rocks of granite, gneiss, and mica-slate) follows the direction of the Cordillera