vicinity of an eastern coast in high and middle latitudes; the compact configuration of a continent having no littoral curvatures or bays; the extension of land toward the poles into the region of perpetual ice, without the intervention of a sea remaining open in the winter; a geographical position, in which the equatorial and tropical regions are occupied by the sea, and, consequently, the absence, under the same meridian, of a continental tropical land having a strong capacity for the absorption and radiation of heat; mountain chains, whose mural form and direction impede the access of warm winds, the vicinity of isolated peaks, occasioning the descent of cold currents of air down their declivities; extensive woods, which hinder the insolation of the soil by the vital activity of their foliage, which produces great evaporation, owing to the extension of these organs, and increases the surface that is cooled by radiation, acting consequently in a three-fold manner, by shade, evaporation, and radiation; the frequency of swamps or marshes, which in the north form a kind of subterranean glacier in the plains, lasting till the middle of the summer; a cloudy summer sky, which weakens the action of the solar rays; and, finally, a very clear winter sky, favoring the radiation of heat.*

The simultaneous action of these disturbing causes, whether productive of an increase or decrease of heat, determines, as the total effect, the inflection of the isothermal lines, especially with relation to the expansion and configuration of solid continental masses, as compared with the liquid oceanic. These perturbations give rise to convex and concave summits of the isothermal curves. There are, however, different orders of disturbing causes, and each one must, therefore, be considered separately, in order that their total effect may afterward be investigated with reference to the motion (direction, local curvature) of the isothermal lines, and the actions by which they are connected together, modified, destroyed, or increased in intensity, as manifested in the contact and intersection of small oscillatory movements. Such is the method by which, I hope, it may some day be possible to connect together, by empirical and numerically expressed laws, vast series of apparently isolated facts, and to exhibit the mutual dependence which must necessarily exist among them.

The trade winds—easterly winds blowing within the tropics—give rise, in both temperate zones, to the west, or west-

* Humboldt, *Recherches sur les Causes des Inflexions des Lignes Isothermes*, in *Asie Centr.*, t. iii., p. 103–114, 118, 122, 188.