

inhabitability of the planet in particular zones. According to Plutarch, *De Plac. Philos.*, ii., 8, Anaxagoras believed "that the world, after it had come into existence and produced from its womb living beings, had of itself inclined toward the south." In the same regard, Diogenes Laertius says of the Clazomenier, "the stars had originally projected themselves in a dome-like layer, so that the pole appearing at any time was vertically over the Earth; but that afterward they assumed an oblique direction." The origin of the obliquity of the ecliptic was considered as a cosmical *event*. There was no question respecting a subsequent progressive alteration.

The description of the two extreme, therefore opposite, conditions to which the planets Uranus and Jupiter approximate most closely, is suited to call to mind the variations which the *increasing* or *decreasing* obliquity of the ecliptic would produce in the meteorological relations of our planet, if these variations were not comprised within *very narrow limits*. The knowledge of these limits, the subject of the great works of Leonhard Euler, Lagrange, and Laplace, may be called one of the most brilliant achievements of modern times in theoretical astronomy and the perfected higher analysis. These limits are so narrow, that Laplace (*Expos. du Système du Monde*, ed. 1824, p. 303) puts forward the opinion that the obliquity of the ecliptic oscillates about its mean position only $1\frac{1}{2}^{\circ}$ toward both sides. According to this statement,* the tropical zone (the tropic of Cancer, as its northernmost and outermost boundary) would approach only so much nearer to us. The result would therefore be, if the numerous other meteorological perturbations are omitted, as if Berlin were gradually displaced from its present isothermal line to that of Prague. The elevation of the mean annual temperature would scarcely amount to more than one degree of the centigrade ($\frac{9}{10}$ of a degree of Fahrenheit's) thermometer.† Biot,

* "L'étendue entière de cette variation serait d'environ 12 degrés, mais l'action du Soleil et de la Lune la réduit à peu près à trois degrés (centésimaux)." "The entire extent of that variation would be about 12° , but the action of the Sun and Moon reduce it to very nearly 3° (centesimal)." —Laplace, *Expos. du Syst. du Monde*, p. 303.

† I have shown in another place, by comparison of numerous mean annual temperatures, that in Europe, from the North Cape to Palermo, the difference of one degree of geographical latitude very nearly corresponds to 0.5° of the centigrade thermometer, but in the western temperature-system of America (between Boston and Charlestown) to 0.9° . (*Asie Centrale*, tom. iii., p. 229.)