without committing ourselves to any further opinion, using for that purpose the information contained in M. Ch. Martins' excellent work. "The most violent convulsions of the solid and liquid elements," says this able writer, "appear to have been themselves only the effects due to a cause much more powerful than the mere expansion of the pyrosphere; and it is necessary to recur, in order to explain them, to some new and bolder hypothesis than has yet been hazarded. Some philosophers have belief in an astronomical revolution which may have overtaken our globe in the first age of its formation, and have modified its position in relation to the sun. They admit that the poles have not always been as they are now, and that some terrible shock displaced them, changing at the same time the inclination of the axis of the rotation of the earth." This hypothesis, which is nearly the same as that propounded by the Danish geologist, Klee, has been ably developed by M. de Boucheporn. According to this writer, many multiplied shocks, caused by the violent contact of the earth with comets, produced the elevation of mountains, the displacement of seas, and perturbations of climate—phenomena which he ascribes to the sudden disturbance of the parallelism of the axis of rotation. The antediluvian equator, according to him, makes a right angle with the existing equator.

"Quite recently," adds M. Martins, "a learned French mathematician, M. J. Adhémar, has taken up the same idea; but, dismissing the more problematical elements of the concussion with comets as untenable, he seeks to explain the deluges by the laws of gravitation and celestial mechanics, and his theory has been supported by very competent writers. It is this: We know that our planet is influenced by two essential movements—one of rotation on its axis, which it accomplishes in twenty-four hours; the other of translation, which it accomplishes in a little more than $365\frac{1}{4}$ days. But besides these great and perceptible movements, the earth has a third, and even a fourth movement, with one of which we need not occupy ourselves; it is that designated *nutation* by astronomers. It changes periodically, but within very restricted limits, the inclination of the terrestrial axis to the plane of the ecliptic by a slight oscillation, the duration of which is only eighteen hours, and its influence upon the relative length of day and night almost inappreciable. The other movement is that on which M. Adhémar's theory is founded.

"We know that the curve described by the earth in its annual revolution round the sun is not a circle, but an ellipse; that is, a slightly elongated circle, sometimes called a circle of two centres, one of which is occupied by the sun. This curve is called the ecliptic.