

It has been maintained by Von Baer,¹⁴ that a certain deflection is experienced by rivers that flow in a meridional direction, like the Volga and Irtisch. Those traveling poleward are asserted to press upon their eastern rather than their western banks, while those which run in the opposite direction are stated to be thrown more against the western than the eastern. When, however, we consider the comparatively small volume, slow motion, and continually meandering course of rivers, it may reasonably be doubted whether this *vera causa* can have had much effect generally in modifying the form of river channels.

§ 2. **Revolution.**—Besides turning on its axis, the globe performs a movement round the sun, termed revolution. This movement, accomplished in rather more than 365 days, determines for us the length of our year, which is, in fact, merely the time required for one complete revolution. The path or orbit followed by the earth round the sun is not a perfect circle but an ellipse, with the sun in one of the foci, the mean distance of the earth from the sun being 92,800,000, the present aphelion distance 94,500,000, and the perihelion distance 91,250,000 miles. By slow secular variations, the form of the orbit alternately approaches to and recedes from that of a circle. At the nearest possible approach between the two bodies,

¹⁴ "Ueber ein allgemeines Gesetz in der Gestaltung der Flussbetten." Bull. Acad. St. Petersburg, ii. (1860). See also Ferrel on the motion of fluids and solids relatively to the earth's surface, Camb. (Mass.) Math. Monthly, vols. i. and ii. (1859-60); Dulk, Z. Deutsch. Geol. Ges. xxxi. (1879) p. 224. The River Irtisch is said in flowing northward to have cut so much into its right bank that villages are gradually driven eastward, Demiansk having been shifted about a mile in 240 years (Nature, xv. p. 207). But this may be accounted for by local causes. See an excellent paper on this subject with special reference to the régime of some rivers in northern Germany, by F. Klockmann, Jahrb. Preuss. Geol. Landesanst. 1882; also E. Dunker, Zeitsch. für die gesammten Naturwissenschaften, 1875, p. 463; G. K. Gilbert, Amer. Journ. Sci. xxvii. (1884) p. 427.