

duces the periodical variations of the length of the days and nights ; or rather, these two effects, the summer heat and the long summer-



[E is the Earth ; G H I its elliptical orbit round the Sun. If the centripetal force of attraction were destroyed, the Earth would fly off in the tangent E F ; if the centrifugal force failed, the Sun would at once draw the Earth to itself.]

days, the winter cold and the dull brief winter-days, are referrible to a common cause—a cause which we shall now proceed to elucidate.

In Figure 18\* we show the Earth in the twelve positions which correspond to the twelve months of the year. During one-half the year, the northern extremity of the terrestrial axis (the upper extremity in our illustration) inclines towards the Sun, and the southern extremity is turned eastward. During the other half, it is the south pole which inclines

towards the Sun, while the northern extremity is directed from it. We see, in our engraving, that the north pole, or Arctic, is

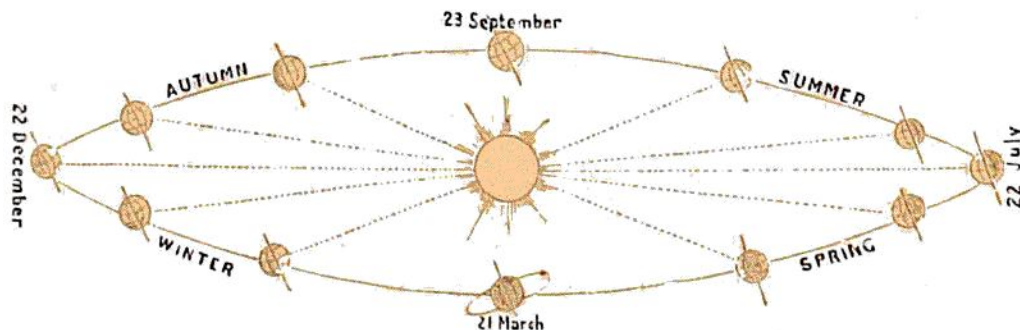


FIG. 18.—POSITION OF THE EARTH IN RELATION TO THE SUN DURING THE TWELVE MONTHS OF THE YEAR.

farthest from the sun about the 22nd of December, and approaches the nearest to it about the 21st of June. The two poles are at an equal angular distance on the 21st of March and the 23rd of

\* From the "Atlas Universel de Géographie Physique," by Bourdin and Hachette, Paris, 1861.