

which, as we have seen, depends on the proportion of velocity of the light in and out of a medium. In the case of one set of vibrations, again, the propagation of the medium may be equally impeded or influenced in all directions of the ray—in which case a wave starting from any point in the surface would run out spherically within the crystal, while in that of the other the amount of obstruction might vary with the direction of the ray, and thus give rise to a wave running out *with different velocities in different directions* from its centre of propagation, and therefore *not spherically*.

(142.) To this conclusion, but without passing through the intermediate considerations which have led us up to it, Huyghens (who certainly had formed no conception of transverse vibrations) appears to have *jumped*, by one of the happiest divinations on record in the history of science, viz., that in the double refraction of Iceland spar, while the ordinary ray is propagated in a *spherical*, that of the extraordinary spreads from its point of origin at the surface of the crystal in an *elliptical* wave, the form being that of an *oblate spheroid* of revolution, having its polar axis parallel to the axis of the rhomboid, and bearing to its equatorial diameter a definite numerical proportion, viz., that of eight to nine (very nearly). Making this assumption, and laying it down as a principle (capable of demonstration), that the direction of a ray of light in such a mode of propagation is not that of a perpendicular to the surface of the wave at any point, but that of a line drawn from the centre of the wave to its point of contact with a plane,