

which, therefore, do not interfere with or enfeeble one another in any part of their previous course. The image of a star on the retina is formed by the union in a focal point of the whole bundle or *pencil* of parallel rays contained within a cylindrical space or column, having the circular opening of the pupil for a base or section, continued through the whole atmosphere, however far it may extend. Now the air, though a very feebly refracting medium, has still a certain amount of refractive power, and *that* a variable one, depending on its density, temperature, and moisture; and corresponding to the degree of this power is the velocity with which it is traversed by the luminous undulations. Now; however the density, temperature, and moisture of the lower and upper regions of the air may differ; if throughout the whole extent of this column it were perfectly uniform in these respects, *at every point of each cross section* of it (however it might differ in different sections) all the rays traversing its length from the star to the eye would have their undulations *equally* retarded by the aerial medium: and therefore all the rays belonging to any one wave setting out at the same instant of time from the star would reach the focal point on the retina at the same moment; such being the condition which determines the focal point of a lens. But if the air in one side of the column should for any considerable distance along it be slightly different in these respects from that in the other, the undulations transmitted along that side would be differently retarded from those along the other, and would not arrive on the retina at the same instant. The one