ally verified by M. Fresnel (to whom its suggestion is due), and more recently by M. Billet himself, who by merely interposing (concentrically) between the luminous point and the centre of the screen, a small *opake* annulus exactly corresponding to the calculated dimensions (for red rays and using red light) of the first even ring (B) obtained an illumination at P estimated at five times that when no obstacle was interposed.

(115.) By way of showing the kind of explanation these principles afford of some of the simplest and easiest cases of diffraction (for their calculation is for the most part very complicated in its details, though simple enough in its principles); let us suppose first the case of a screen illuminated by a minute radiant point O through a small circular aperture, and consider only the illumination of the central point of projection on the screen, or of P in our figure. Suppose P to approach the screen from a very great distance—so great that the *difference of its distance from the centre and either edge of the aperture* shall be less than a semi-undulation of the light considered (say 100,000th of an inch). Then the undulations from every part of the aperture will reach P in phases more or less accordant with each other, and P will therefore be more or less illuminated: and, P still approaching, its illumination will increase till it attains such a distance that the difference in question exactly equals a semi-undulation. In this case the portion of the wave transmitted corresponds precisely to the whole of the central circle (A) of our system of wave-zones above discussed, and we have here the greatest possible