these alterations are more intense in reality than they appear to the naked eye; for when the several points of the retina

harmony or at variance with one another, and increase or destroy one another according to the various degrees of refraction of the strata through which they have passed. The whole of the red rays alone can destroy one another, if the rays to the right and left, above and below them, have passed through unequally refracting media. We have used the term *alone*, because the difference of refraction necessary to destroy the red ray is not the same as that which is able to destroy the green ray, and *vice versa*. Now, if the red rays be destroyed, that which remains will be white minus red, that is to say, green. If the green, on the other hand, be destroyed by *interference*, the image will be white minus green, that is to say, red. To understand why planets having large diameters should be subject to little or no scintillation, it must be remembered that the disk may be regarded as an aggregation of stars or of small points, scintillating independently of each other, while the images of different colors presented by each of these points taken alone would impinge upon one another and form white. If we place a diaphragm or a cork pierced with a hole on the object-glass of a telescope, the stars present a disk surrounded by a series of luminous rings. On pushing in the eye-piece, the disk of the star increases in diameter, and a dark point appears in its center; when the eye-piece is made to recede still further into the instrument, a luminous point will take the place of the dark point. On causing the eye-piece to recede still further, a black center will be observed. If, while the center of the image is black, we point the instrument to a star which does not scintillate, it will remain black as before. If, on the other hand, we point it to a scintillating star, we shall see the center of the image alternately luminous and dark. In the position in which the center of the image is occupied by a luminous point, we shall see this point alternately vanish and reappear. This disappearance and reappearance of the central point is a direct proof of the variable interference of the rays. In order to comprehend the absence of light from the center of these dilated images, we must remember that rays regularly refracted by the object-glass do not reunite, and can not, consequently, interfere except in the focus; thus the images produced by these rays will always be uniform and without a central point. If, in a certain position of the eye-piece, a point is observed in the center of the image, it is owing to the interference of the regularly refracted rays with the rays *diffracted* on the margins of the circular diaphragm. The phenomenon is not constant, for the rays which interfere at one moment no longer do so in the next, after they have passed through atmospheric strata possessing a varying power of refraction. We here meet with a manifest proof of the important part played in the phenomenon of scintillation by the unequal refrangibility of the atmospheric strata traversed by rays united in a very narrow pencil."

"It follows from these considerations that scintillation must necessarily be referred to the phenomena of *luminous interferences* alone. The rays emanating from the stars, after traversing an atmosphere composed of strata having different degrees of heat, density, and humidity, combine in the focus of a lens, where they form images perpetually changing in intensity and color, that is to say, the images presented by scintillation. There is another form of scintillation, independent of the focus of the telescope. The explanations of this phenomenon advanced