

is called the *penumbra* in ordinary shadows, which arises from the angular diameter of the sun.* Quite otherwise. A shadow indeed *is* formed, but instead of a sharp and sudden transition from darkness to light, it terminates in three coloured fringes, following its contour, the inner being the broadest and more distinctly coloured, the outer extremely faint and feebly tinted. The order of the colours, reckoning from the first *dark* fringe, is, generally speaking, analogous to that of the colours of thin plates proceeding outwards from the dark centre rings, only degrading more rapidly, viz., blue within, and yellow and red without. And that the tints originate in the same way from the superposition of a series of dark and bright fringes of the different prismatic colours, of different breadths, is shown (as in the colours of thin plates) by throwing on the lens in succession the several coloured prismatic rays, when the fringes are seen in each colour much more numerous and sharply defined, being broadest in red light and narrowest in violet.

(105.) If the object casting the shadow be long and very narrow, as a hair or a strip of card not more than a 30th of an inch broad, the phænomena are still more curious and complex. Besides the exterior coloured fringes already described, others are seen *within the shadow*, running parallel to its length, similarly disposed along both its edges, and blending in the middle into a

* The diffracted fringes may be seen very well on the borders of shadows cast by the light of Venus when at its greatest brightness, on a white surface, in a room with a single window, and under favourable circumstances as to twilight.