diminution) will be returned, and, passing back through the first surface (with only the same trifling *per-centage* of loss), will, on emerging, *be superposed on the first reflected series*, with which it will be coincident in direction. If then the thickness of the plate be such that in passing to the hinder surface, back again, and out at the first, the second series shall have *lost upon the first* precisely one, three, five, or any odd number of *semi*-undulations, it will begin to emerge in the exact opposite "phase" of its period to that of the undulation of the first reflected series which starts from the same point at the same instant. Here, then, we have the case contemplated above of two series of equal waves entering the same "channel" in opposite phases. They will therefore destroy each other, or the intensity of the joint ray will be *nil*. The contrary will happen if the thickness be such as to produce a retardation of two, four, or any even number of semi-undulations. In that case the two reflected rays will conspire and produce a joint one of double intensity: and of intermediate in the various cases of intermediate retardation.

(85.) Thus we see that the degree of brightness of the reflected light depends on the thickness of the reflecting film, and that for a certain series of thicknesses *in arithmetical progression*, the joint reflection is *nil;* for another series exactly intermediate, it attains a maximum of intensity; and between these limits, all gradations of illumination will arise according to the intermediate thicknesses supposed to exist. This is so far in general accordance with the phænomena described : but before applying it to the