medium corresponds to the series of larger balls in this illustration. This ought to be so, for the velocity is less in the denser medium as it is in the larger of two balls after their collision; and because, as already remarked, the ether in such media must be either denser in proportion to its elastic force, or somehow encumbered by their material atoms. And hence we finally conclude that in the act of the reflexion of light on the surface of a rarer medium, the phase of the undulation changes, and a *semi-undulation* is lost (or gained—it matters not which): but not so when the light is reflected from a denser medium.

(89.) To return now to the case of a thin pellucid film. If its thickness, *i.e.*, the interval separating its two surfaces, be any number of *semi*-undulations; double that number, *i.e.*, an exact number of entire waves, will have been lost by the wave reflected from the second surface at its re-emergence from the first, by reason of its greater length of path; and thus were no part of an undulation lost or gained *in the act of reflexion*, it would start thence in exact harmony with the first reflected ray. But the second reflexion being made at the surface of a rarer medium, an additional *semi-undulation* will have been lost, so that the two reflected rays will really start from the first surface in *complete discordance*, and destroy each other. The same is the case if the thickness be *nil*, or so excessively minute as to be much less than the length of a wave, as at the vertex of a soap-bubble when just about to burst. Here also will the same mutual destruction of the reflected waves take place. And thus