we have explained the complete or very nearly complete darkness of the central spot, and of a series of rings corresponding to thickness of $1,2,3$, or more semi-wave lengths. At the intermediate thicknesses (i.e., of $\mathrm{x}, 3,5, \& c$. , quarter-wave-lengths) the exact reverse will happen-the reflected rays will start together in harmony and appear as a ray of double intensity, thus explaining the intermediate bright rings.
(90.) In the case of the rings produced between two glasses of the same material, the intermediate film being air, it is the reflexion from its first surface, not its second, that is effected from a rarer medium ; so that it is at this surface that the additional semi-undulation is grained by the first reflected ray. In all other respects the reasoning is the same in both cases, and the explanation equally complete in both.
(91.) It will be perceived that we have not been sparing of words in this explanation. The epigrammatic style is ill-suited to clearness in the exposition of a principle which it is essential to seize with perfect distinctness, and in seizing which considerable difficulty is commonly experienced. If any doubt or misgiving, however, should still linger on the mind as to the applicability of the analogy by which the loss of half an undulation necessitated by the blackness of the central spot has been explained, a simple but striking experiment will suffice to dissipate it. Let a set of rings be formed by interposing, between two glasses of very different refractive densities, a film of liquid intermediate in that respect-as, for instance, oil of sassafras be

