

NOTES ON THE CAUSE OF THE BLUE COLORATION
OF THE BLUE LYCÆNIDS.

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The question has recently been raised by certain entomologists whether the blue tint of the blue species of the genus *Lycæna* and its allied genera is actually due to blue pigment or dye in the scales of the upper surface of the wings, or whether it is due to a kind of "construction" similar perhaps to the apparent construction of a green tint on the under surface of the wings of certain species of the genus *Euchloe*. The latter, as is well known, on examination by a microscope, is found to be caused not by a field of green scales, but by one of black and yellowish scales intimately mixed in approximately equal quantities. I do not think that it has ever been suggested that the blue colour of the Lycænids is produced by an exactly similar *mixing* of scales of two distinct colours, but it has been suggested that the blue tint is due to the superposition of a layer of white, practically transparent scales over a layer of dark-brown or blackish scales, and that the blue effect is in reality either an illusion as in the case of the *Euchloid* green tints, or else a phenomenon of interference of light, analogous, perhaps, to the production of the rainbow tints between two reflecting surfaces very close together and separated by a transparent medium, these being known as "Newton's Rings." They are familiar to all in the bright colours visible on the surface of soap bubbles as well as the bright tints seen on the surface of stagnant water, or on the fine film of oil covering the surface of oily water and at times in puddles of automobile oil on roads. Now it can, I think, be clearly shown that this latter suggestion is not the correct explanation of the present case. The colours of "Newton's Rings" depend upon the angle from which they are viewed, as well as upon the distance between the surfaces. If one looks at stagnant water from different angles, it will be seen that the colour at any one point varies according to the angle, and if the blue colour were due to any such cause as those which produce "Newton's Rings," the colour should pass right through the spectrum from red to violet or vice versa, as the angle of sight was shifted. But not only is this not the case, but if the wing of a blue butterfly is placed between two strips of glass and subjected to pressure, thus changing the distance between the two surfaces of any one scale and also between the two layers