## THE CANADIAN ENTOMOLOGIST

by transmitted light. Gold leaf appears yellow by reflected light, and green by transmitted light. A solution of chlorophyll in alcohol appears a beautiful green colour by transmitted light, but blood-red by strong reflected light. Aniline dyes show this property also, and hence it is quite possible that if there is colouring matter in the scales, that it may also show complimentary colours when viewed by reflected and transmitted light. Now, the light scales always appear more or less distinctly yellow by transmitted light, and yellow is complimentary to blue. If now such an assemblage of loose and scattered scales be viewed by a microscope with reflected illumination and against a dark or quite black background, it will be at once seen, provided the illuminating light is white or nearly so, that the light scales are strongly tinted with blue and often are very blue. The dark ones on the contrary remain dark and show practically no colour except occasional metallic flashes tinted either blue, green or red. Hence we see here that the light transparent scales have undoubtedly the power to appear blue quite independently of whether they are superimposed on the dark ones. If they are now examined against a white background, such as a piece of white paper, they still appear bluish, but are much paler in colour owing to their transparency. If they are further observed against backgrounds of different colours, red, green, yellow, orange, violet or blue, they always appear distinctly blue, although the background may be seen through them, thus complicating the apparent colour. Against a neutral background or a dark-brown one such as dark-brown paper they appear as blue as when viewed in their natural positions on the wing. Furthermore, when two of these blue scales overlap the density of the blue is very much increased, and in the natural positions they occupy on the wing there is a great deal of such overlapping. Again, it will be noticed that the blue scales taken from the wings of very pale or silvery blue butterflies, such as Lycana argiolus, or pseudargiolus, appear very pale blue when isolated and examined by reflected light, and are practically invisible against a background of white paper. With transmitted light they appear very pale yellow. Similar scales taken from butterflies of a more intense blue, such as Lycana bellargus, appear darker blue by reflected light, and much darker yellow by transmitted light, which is easily and obviously explainable on

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