

The colours of the striae in mica

On examining even the most regularly split and transparent pieces of mica by diffuse reflected light, a few fine hair-like and rather irregular lines may generally be seen running along the surface. We have found that these lines or striae show some very interesting effects when mica is examined in a Töpler 'Schlieren' apparatus. The sheet as a whole, being optically good, remains invisible, but the striae shine out as brilliant and vividly coloured lines of light, the colours being different for different striae, and changing in a remarkable manner as the inclination of the mica relatively to the direction of the light in the apparatus is altered. For instance, a stria at normal incidence may appear crimson and, as the mica is rotated about an axis in its own plane, become successively purple, green, yellowish-green, yellow, orange, scarlet-red, green, yellow and red.

The phenomenon is being investigated in detail by one of us (P N Ghosh), but as to its general nature there appears to be little doubt. The striae are lines at which the thickness of the mica changes in a discontinuous manner, and the luminosity is due to the radiation from the discontinuity acting as a laminar diffracting boundary. For any particular wavelength the radiation is zero if the retardation of the wavefront on either side of the discontinuity differs by an even multiple of half a wavelength, and is approximately a maximum if the difference is an odd multiple of half a wavelength. The detailed mathematical investigation would follow the general lines indicated by Lord Rayleigh in his theory of the Foucault 'knife-edge' test (*Philos. Mag.*, February, 1917).

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