The advantages of apochromatic and fluorite lenses are particularly apparent when highly coloured objects have to be observed (e.g., counter-stained biological specimens), and they are also very useful for colour photography and in general photomicrography where it is possible to employ coloured filters and plates of different spectral sensitivities without affecting the definition of the image. The improved spherical correction enables increased resolving power and image crispness to be obtained in many cases. No improvement in field curvature is to be expected from this type of objective.

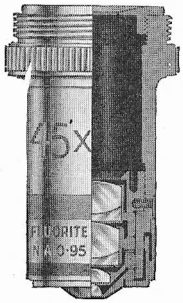

Fig. 3-14. FLUORITE OBJECTIVE, 3·75 mm., N.A. 0·95, 45× (OIL IMMERSION)

Despite the very perfect axial images which are produced by the use of apochromatic and fluorite objectives, there remains one defect of the extra-axial image which would be detrimental if Huyghens eyepieces were employed. This is the oblique chromatic aberration which results from the magnification varying with the colour of the image and gives rise to coloured fringes on details near the edge of the field of view. High-powered achromats also suffer from this defect, which is eliminated by the use of compensating eyepieces, specially computed in order to cancel out the oblique chromatic aberration of the objectives.

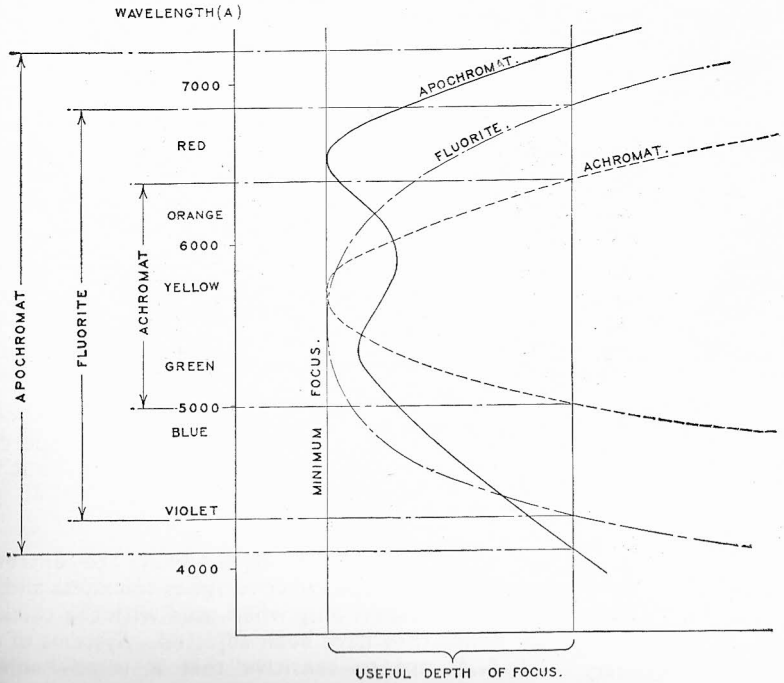

Fig. 3-15. TYPICAL COLOUR CURVES, ILLUSTRATING VERTICALLY THE RANGE OF WAVELENGTHS USEFULLY CONTRIBUTING TO THE IMAGE FORMATION BY HIGH POWER APOCHROMATIC, FLUORITE, AND ACHROMATIC OBJECTIVES, AND HORIZONTALLY THE RELATIVE POSITIONS ALONG THE AXIS AT WHICH THE VARIOUSLY COLOURED RAYS FOCUS