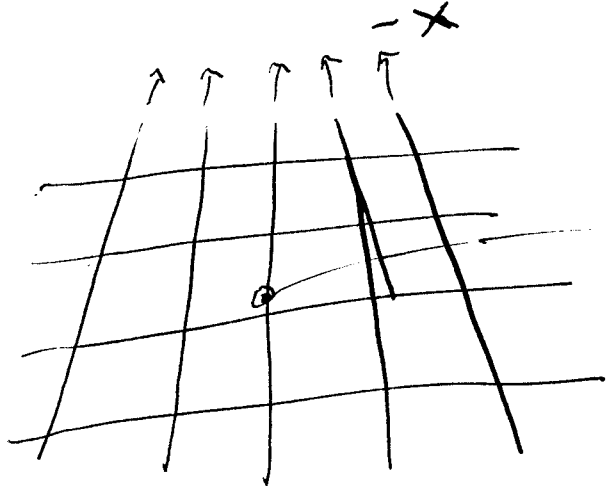
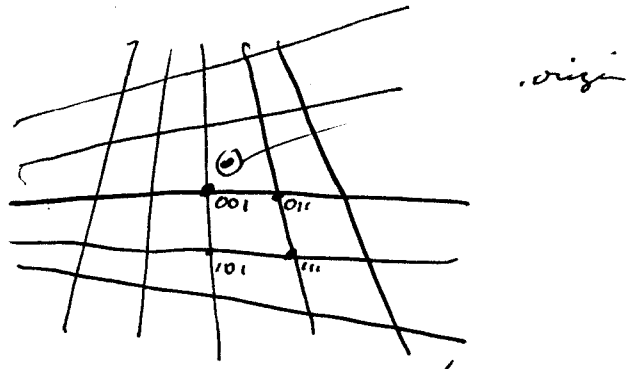
cubic

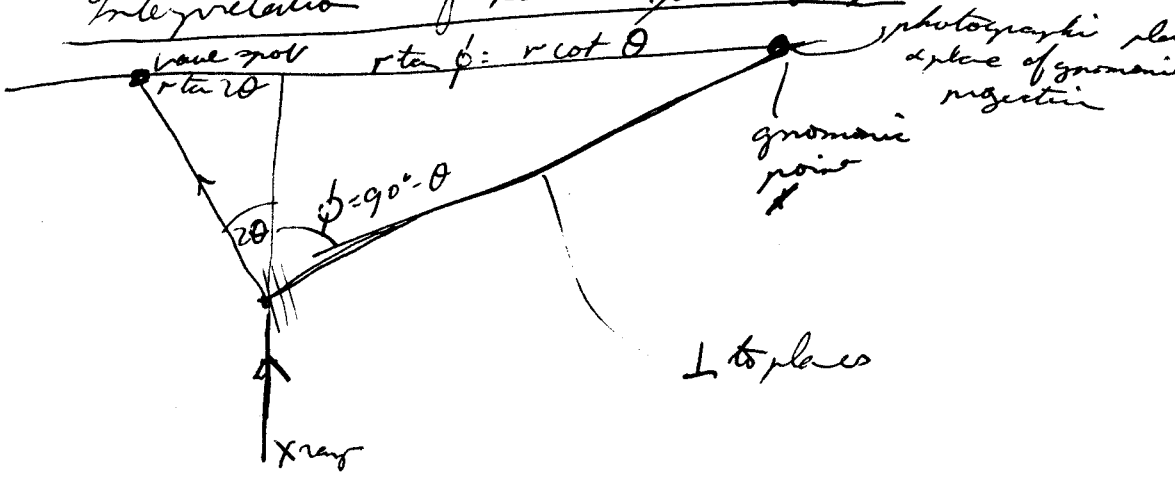


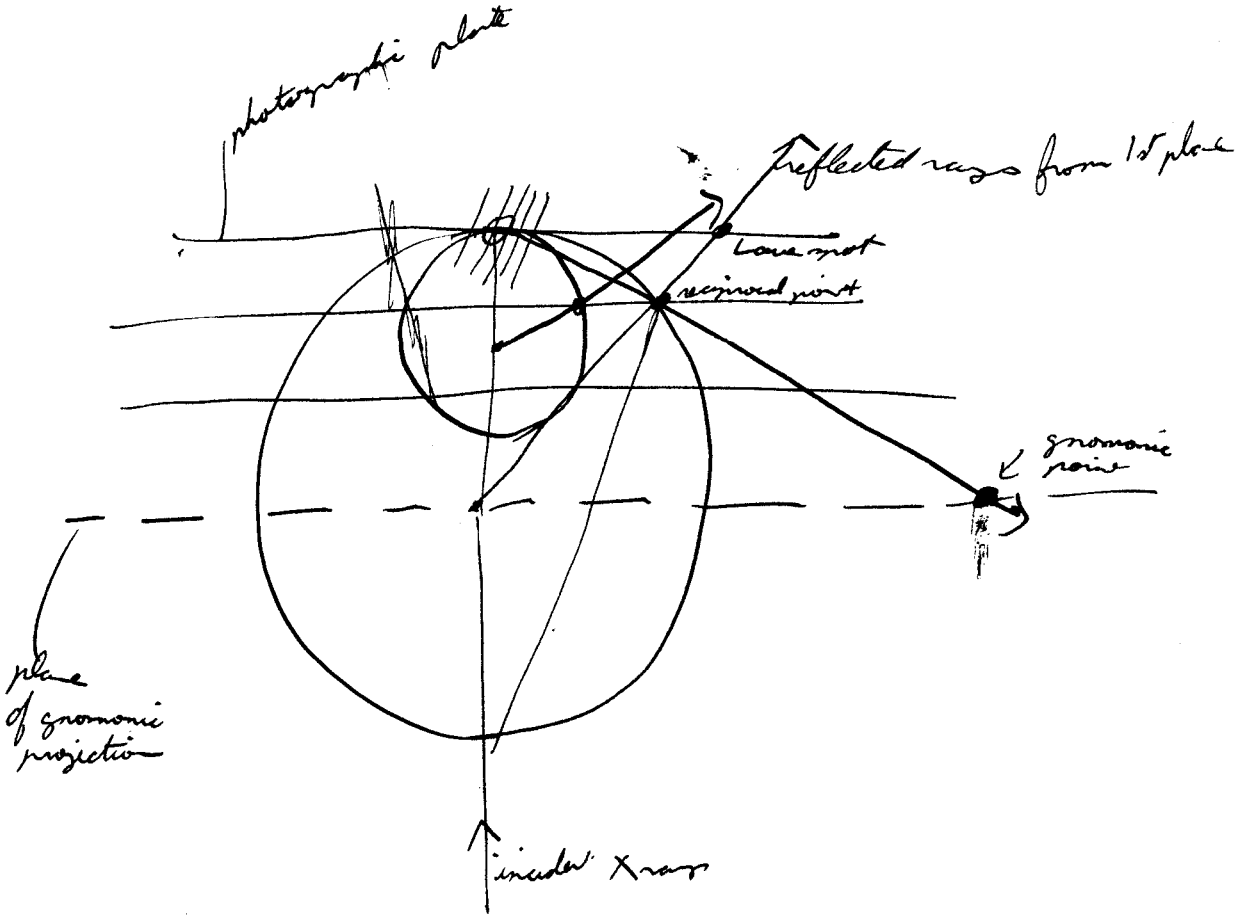

single distortion




double distortion

## Interpretation of Laue photograph






– gives connection between { Laue spot, reciprocal point, gnomonic point }

Spots nearest centre in Laue photo correspond to 1st plane of reciprocal pts not passing through origin

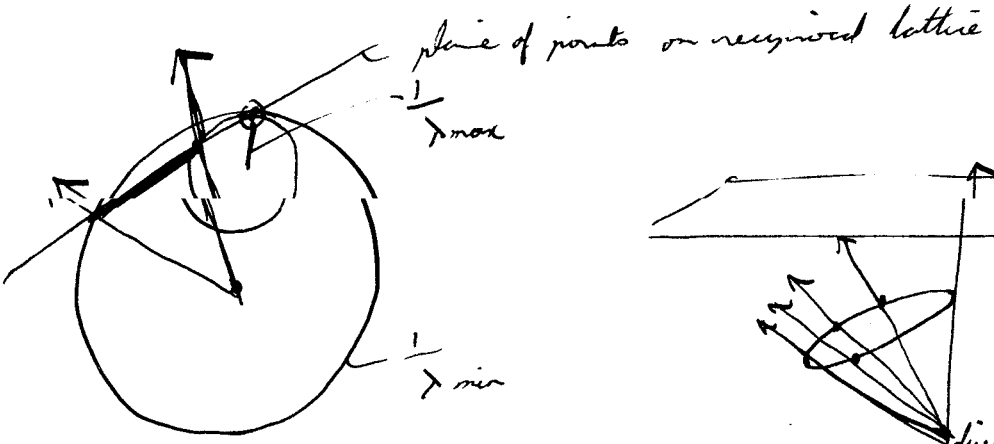
∴ as spots close to centre

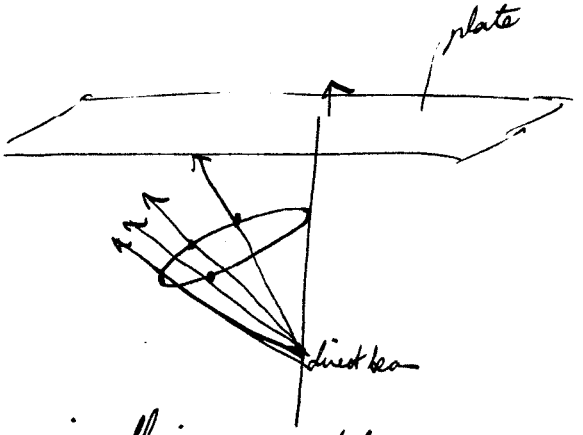
mean spots corresp. to shorter wave lengths

## Reciprocal lattice for Laue photograph

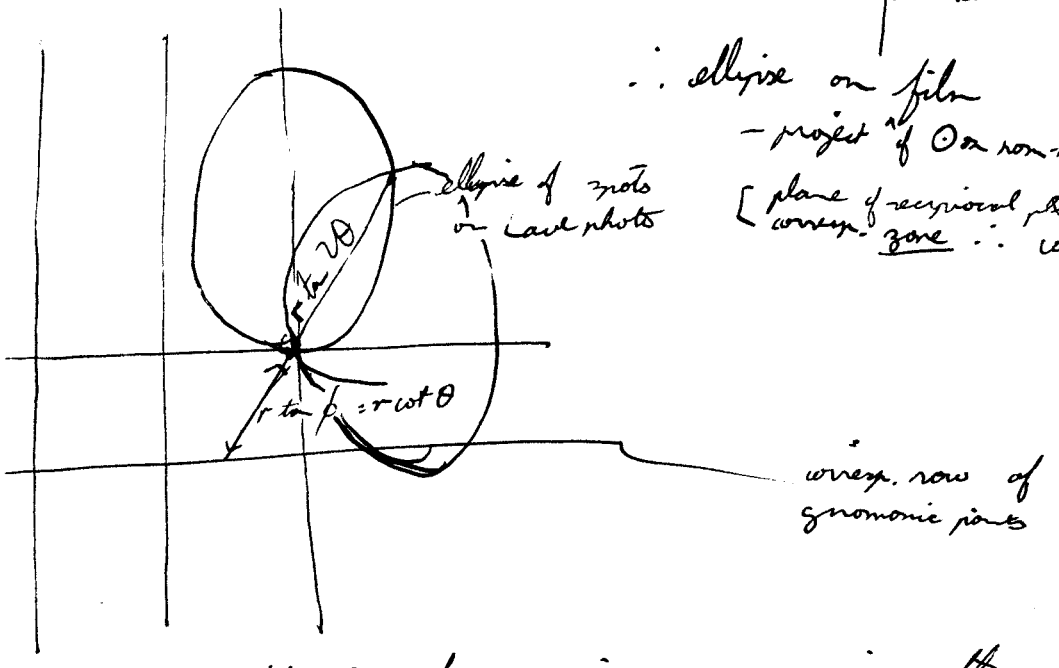
$$\alpha^* = \frac{1}{\alpha}$$

radius of reflecting circle $= \frac{1}{\lambda}$

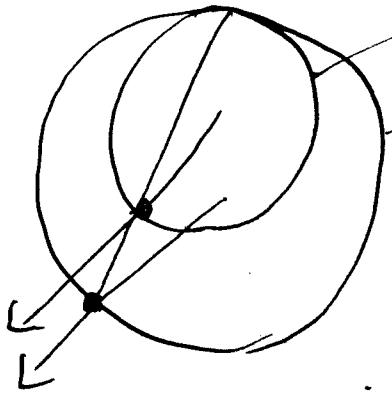



∴ ellipse on film
– project of ⊙ on non-∥ plane
[plane of reciprocal pts corresp. zone ∴ cone]

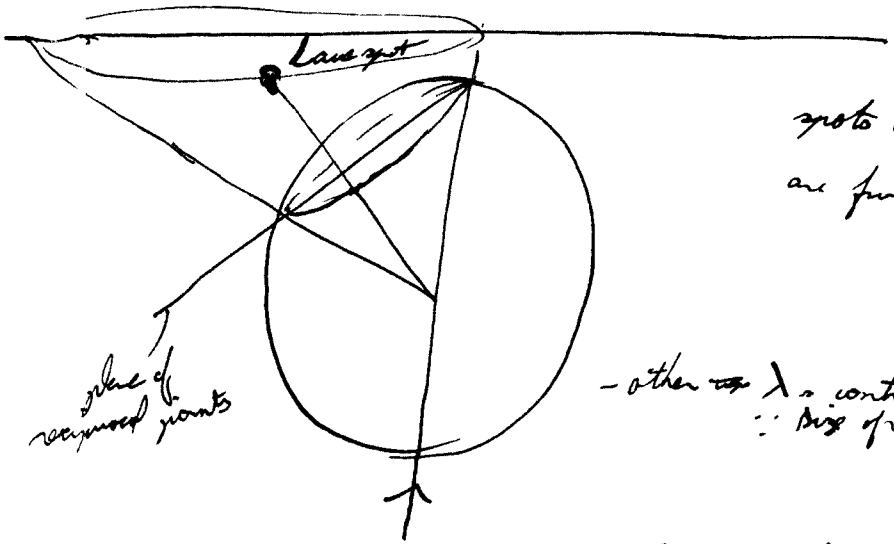



Direction of reflection from point row passing through origin is the same no matter what the wave length



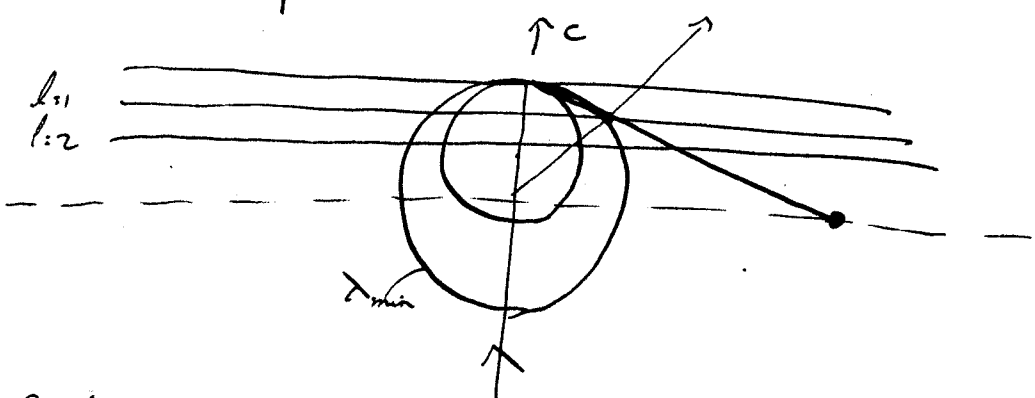
reflecting circles for different λ

∴ size of reflecting circle does not affect direction

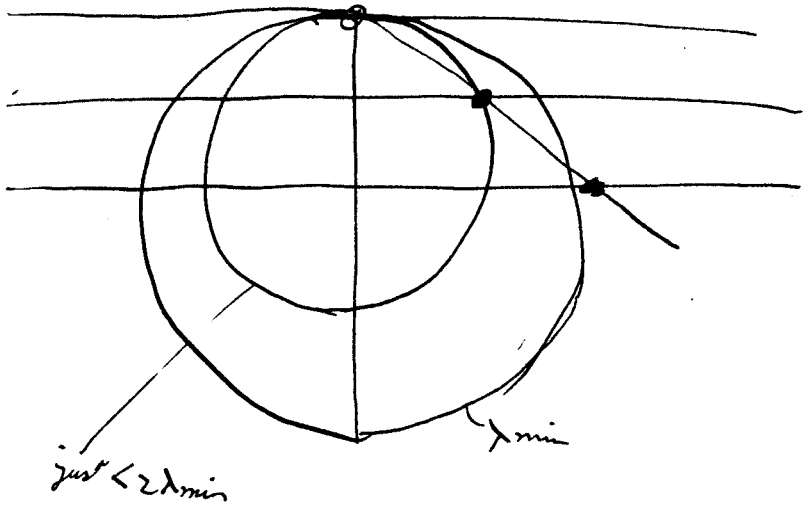



spots on one ellipse are from planes in a zone

- other λ's contribute to same ellipse
∴ size of reflecting ⊙ doesn't affect ross. direction




Spots occurring near centre of photograph correspond to gnomonic points at corners of the unit cells
- 1st order spots

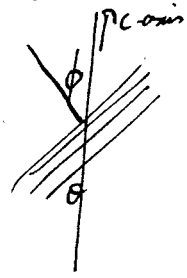



If $\lambda = 2\lambda_{min}$ 2 reflections superimposed

$\therefore$ for 1st order reflection $a < \frac{2\lambda_{min}}{2\sin\theta}\sqrt{h^2+k^2+l^2}$

<u>MgO</u>

$d = \frac{a}{n\sqrt{h^2+k^2+l^2}}$ $\quad$ $h, k, l$ indices read off from projection
$n$ is order of reflection

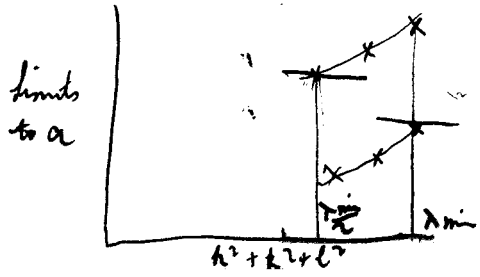



$$\cos\phi = \frac{h.0+k.0+l.1}{\sqrt{h^2+k^2+l^2}\sqrt{0+0+1}} = \frac{l}{\sqrt{h^2+k^2+l^2}}$$

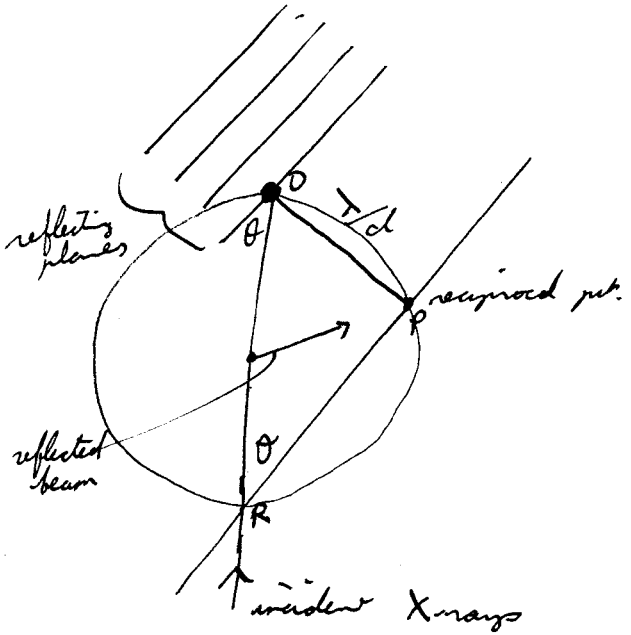
$\phi = 90^\circ - \theta \qquad \cos\phi = \sin\theta$

$$\lambda = 2d\sin\theta = \frac{2al}{n(h^2+k^2+l^2)}$$

Consider only points at corners of gnomonic net $\quad l = 1$
For $h\,k\,l$ having largest values $\quad \lambda$ near $\lambda_m$




take upper limit just before $n = 2$




From Bragg's law

$\lambda = 2d \sin\theta$

$\frac{\lambda}{d}/2 = \sin\theta$

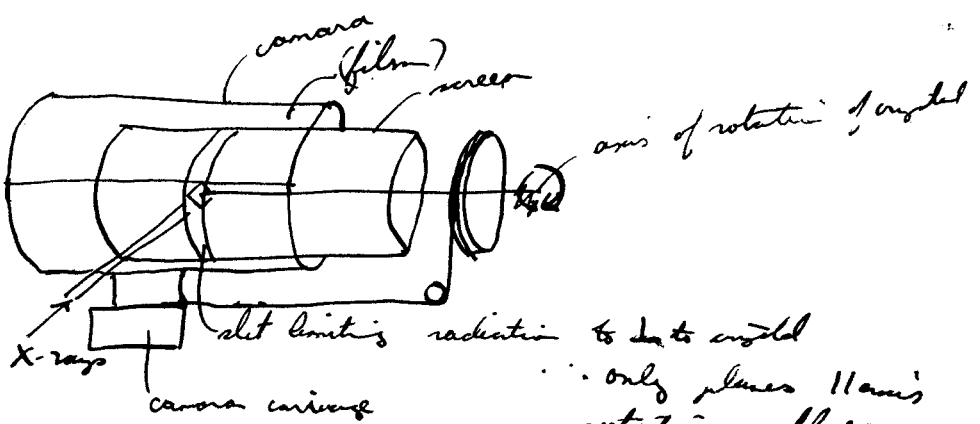
$\therefore OR = 2$

$OR = 2$ for every reciprocal pt

$\therefore$ OR is diameter of O on wh. all reciprocal pts. lie.

## Weissenberg photograph

Film (cylindrical) moves as crystal rotates




$\therefore$ only planes $\parallel$ axis of rotation reflect