R^m = Radius of Curvature of the Meridian

$R^m\,dL = ds = \frac{dr}{\sin w} = \frac{dr}{e \sin L}$; The differential of (10) is

$= -ae \sin L\,dL = -H\,dr + (a-r)\,dH$

$dH^2 = 2H\,dH = -2e^2 \sin L_1 \cos L\,dL$

$H\,dr = ae \sin L_1\,dL_1 - \frac{e^2 (a-r) \sin L \cos L\,dL}{H}$

$= ae \sin L_1\,dL_1 - \frac{ae^3 \sin L \cos L\,dL}{H^2}$

$= \frac{ae \sin L_1\,dL_1}{H^2}(H^2 - e^2 \cos^2 L)$

$= \frac{ae \sin L\,dL}{H^3}(1 - e^2 \sin^2 L - e^2 \cos^2 L)$

$= \frac{ae(1-e^2) \sin L\,dL}{H^3}$

$R^m \qquad R^m = \frac{dr}{\sin L\,dL} = \frac{ae(1-e^2) \sin L\,dL}{e H^3 \sin L\,dL} = \frac{(1-e^2)}{H^3}$

$R^m = \frac{H}{a} \cdot \frac{H^3}{1-e^2} = \frac{H}{a} \cdot \frac{1 - e^2 \sin^2 L}{1-e^2} = \frac{1}{(1-e^2 \sin^2 L)(1-e^2)^{-1}}$

R^m (Blunt) $= \frac{H}{a}(1 - e^2 \sin^2 L)(1 + e^2 + etc) = \frac{H}{a}(1 + e^2 \sin^2 L + etc)$

$= \frac{H}{a}(1 + e^2 \cos^2 L + etc) = P \sin 1''$

$N'M = N'M'$

$= P'N' \sec L$

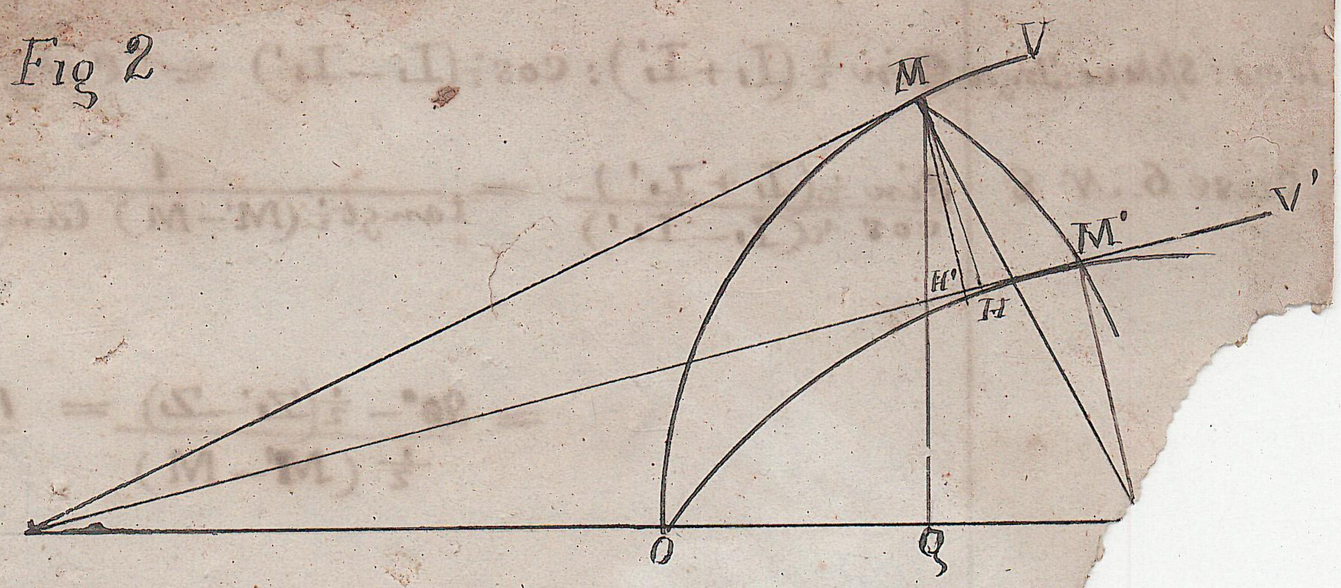
$= x \sec L$

$= \frac{a}{H}$

R^v $= R^v$

$= N$ (NB. P'N' Fig: 1. is the same as N'M, NM in Fig 2)

Fig 2



$= N$

$\frac{H}{a} = \frac{\sqrt{1-e^2 \sin^2 L_1}}{a}$

$= \frac{1 - \frac{1}{2} e^2 \sin^2 L}{a}$

A $= A \sin 1''$

R (Blunt) $= R \sin 1''$

$= \frac{1}{R^v}$