

Dragt 38 cont.

6/6

$\therefore$  the equation of motion for  $\xi$  becomes

$$m \left[ 1 + \frac{4\rho_0^2}{a^2} \right] \ddot{\xi} = -\xi \left[ 3m\omega^2 + \frac{2mg}{a} \right] + \text{HOT}$$

This is an harmonic oscillator eqn with

$$\text{frequency } \Omega^2 = \frac{3\omega^2 + \frac{2g}{a}}{\left[ 1 + \frac{4\rho_0^2}{a^2} \right]}$$

But  $\omega^2 = \frac{2g}{a}$  +  $\rho_0^2 = ah$ . Therefore,

$$\Omega^2 = \frac{8g/a}{\left[ 1 + 4h/a \right]}$$

or

$$\Omega = \left( \frac{8g}{4h+a} \right)^{1/2}$$