where **B** = 1 gauss = $6.9065m^{-1}$ (field lines per meter) and where the magnetic angular velocity ω measured per gauss is:

$$\omega = 2\pi F_{cyclo} = 2\pi[(W_k/2\pi) * \mathbf{B}] = W_k\, \mathbf{B} = c * \mathbf{B}/\eta = 1.7588 * 10^7 \text{ rad sec}^{-1} =\!\int\!= 1 \text{ gauss} * c/\eta$$

This, effectively, is what gaussmeters measure empirically as a 'gauss', and not the real term for **B** = $6.9065m^{-1} =\!\int\!= \ell^{-1}$. To get the real term **B**, one must divide the value read in 'gauss' by c and then multiply it by the Correa-eta constant η and by the angular quantity $\omega = 1.7588 * 10^7$ rad $sec^{-1}$:

$$1 \text{ real gauss} = \omega\, \eta/c = \omega\, /W_k = 1 \text{ read gauss} * \omega\, \eta/c$$

Assume we read 1G. Then the real value of **B** is -

$$\mathbf{B} = \text{'1G'} * \eta * (1.7588 * 10^7 \text{rad sec}^{-1})/c = 6.9065m^{-1}$$

Likewise, to determine the cyclotron frequency $F_{cyclo}$ from a reading in 'gauss', we must multiply the reading by $\omega = 1.7588 * 10^7$ rad $sec^{-1}$ and then divide by 2π to obtain $F_{cyclo.}$ Thus, for a reading of 1G we have -

$$F_{cyclo} = \text{'1G'} * (1.7588 * 10^7 \text{ rad sec}^{-1})/2\pi = 2.8 * 10^6 \text{ sec}^{-1}$$

14. It follows therefore that if all three quantities - **B**, **H** and **M** - are to have the same dimensionality, this can only be $\ell^{-1}$. Then we can write the volumetric ratio of the magnetic dipole moment as the magnetization vector **M** of dimensionality $\ell^{-1}$, by applying what we have just learned for **B**:

$$\mathbf{M} = \frac{\text{magnetic dipole moment}}{\text{volume}} * \frac{\eta}{\mathbf{c}} =\!\int\!= \frac{\ell^3 t^{-1}}{\ell^3} * \ell^{-1} t = \ell^{-1}$$

Since **B** is an angular measure of distance or length, the other two quantities, **H** and **M,** should be angular as well. However, if that is the case, then the relation of permeability that serves as ratio between **B** and **H** -