$$F = \frac{m}{l}\left\{ v_{1x}^2 + v_{2x}^2 + v_{3x}^2 + \cdots\cdots \right\}$$

$$F = \frac{mN}{l}\left\{ \frac{v_{1x}^2 + v_{2x}^2 + v_{3x}^2 + \cdots\cdots}{N} \right\}$$

$$F = \frac{mN}{l}\,\overline{v_x^2} \quad \text{—— (9)}$$

$\overline{v_x^2} \rightarrow$ av. of square of x-component of the molecules of the gas.

$$P = \frac{F}{A_{abcd}} \quad \Rightarrow \quad P = \frac{\frac{mN}{l}\cdot\overline{v_x^2}}{l^2}$$

$$\Rightarrow \quad P = \frac{mN}{V}\,\overline{v_x^2} \quad \text{—— (10)}$$

$\because \quad v^2 = v_x^2 + v_y^2 + v_z^2$

$$v_1^2 + v_2^2 + \cdots = (v_{1x}^2 + v_{1y}^2 + v_{1z}^2) + (v_{2x}^2 + v_{2y}^2 + v_{2z}^2) + \cdots\cdots$$

$$= (v_{1x}^2 + v_{2x}^2 + \cdots) + (v_{1y}^2 + v_{2y}^2 + \cdots)$$
$$+ (v_{1z}^2 + v_{2z}^2 + \cdots)$$

$$\Sigma v^2 = \Sigma v_x^2 + \Sigma v_y^2 + \Sigma v_z^2$$