


A black and white cartoon illustration of a classroom. A professor with a beard and a white shirt stands at the front, looking towards the students. Several students are seated at desks, some holding papers or books. The scene is framed by a simple black border. Two blue speech bubbles are overlaid on the image. The first bubble, located in the upper right, contains the text 'Bomba unidade'. The second bubble, located in the lower center, contains the text 'Aula 12 de laboratório'.

Bomba unidade

Aula 12 de
laboratório



A bomba unidade é a bomba que é semelhante a todas as bombas


$$\frac{1}{n_q^2 \times D_{rm}^2} = \frac{H_B}{n^2 \times D_{rp}^2} \therefore \frac{D_{rm}^2}{D_{rp}^2} = \left(\frac{n}{n_q}\right)^2 \times \frac{1}{H_B} \rightarrow (I)$$

$$\frac{1}{n_q \times D_{rm}^3} = \frac{Q}{n \times D_{rp}^3} \therefore \frac{D_{rm}^3}{D_{rp}^3} = \frac{n}{n_q} \times \frac{1}{Q} \rightarrow (II)$$

$$(I)^3 \text{ e } (II)^2 \therefore \left(\frac{n}{n_q}\right)^6 \times \left(\frac{1}{H_B}\right)^3 = \left(\frac{n}{n_q}\right)^2 \times \left(\frac{1}{Q}\right)^2$$

$$\left(\frac{n}{n_q}\right)^4 = \left(\frac{1}{Q}\right)^2 \times (H_B)^3 \therefore n_q = n \times \frac{\sqrt{Q}}{\sqrt[4]{H_B^3}}$$

É ela no ponto de maior rendimento com opera com $Q = 1\text{m}^3/\text{s}$, $H_B = 1\text{m}$ e com a rotação n_q



Importante:

$$n_{qUSA} = 52 \times n_{qSI}$$

$$1 \frac{\text{m}^3}{\text{h}} = 4.402868 \times \text{gpm}$$

Podemos ainda estimar
o rendimento
conhecendo a vazão e o
 n_q

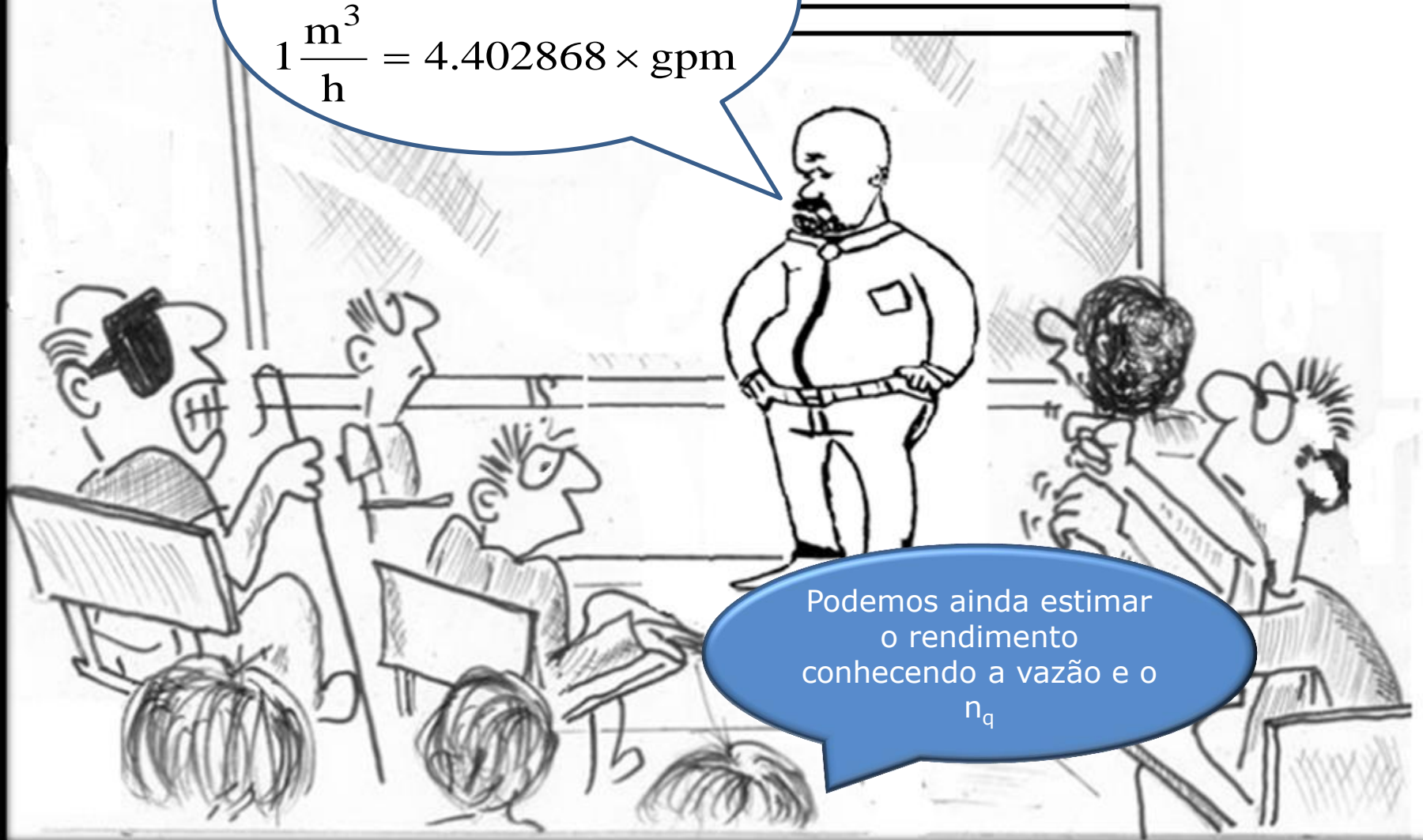


Fig. 5.8

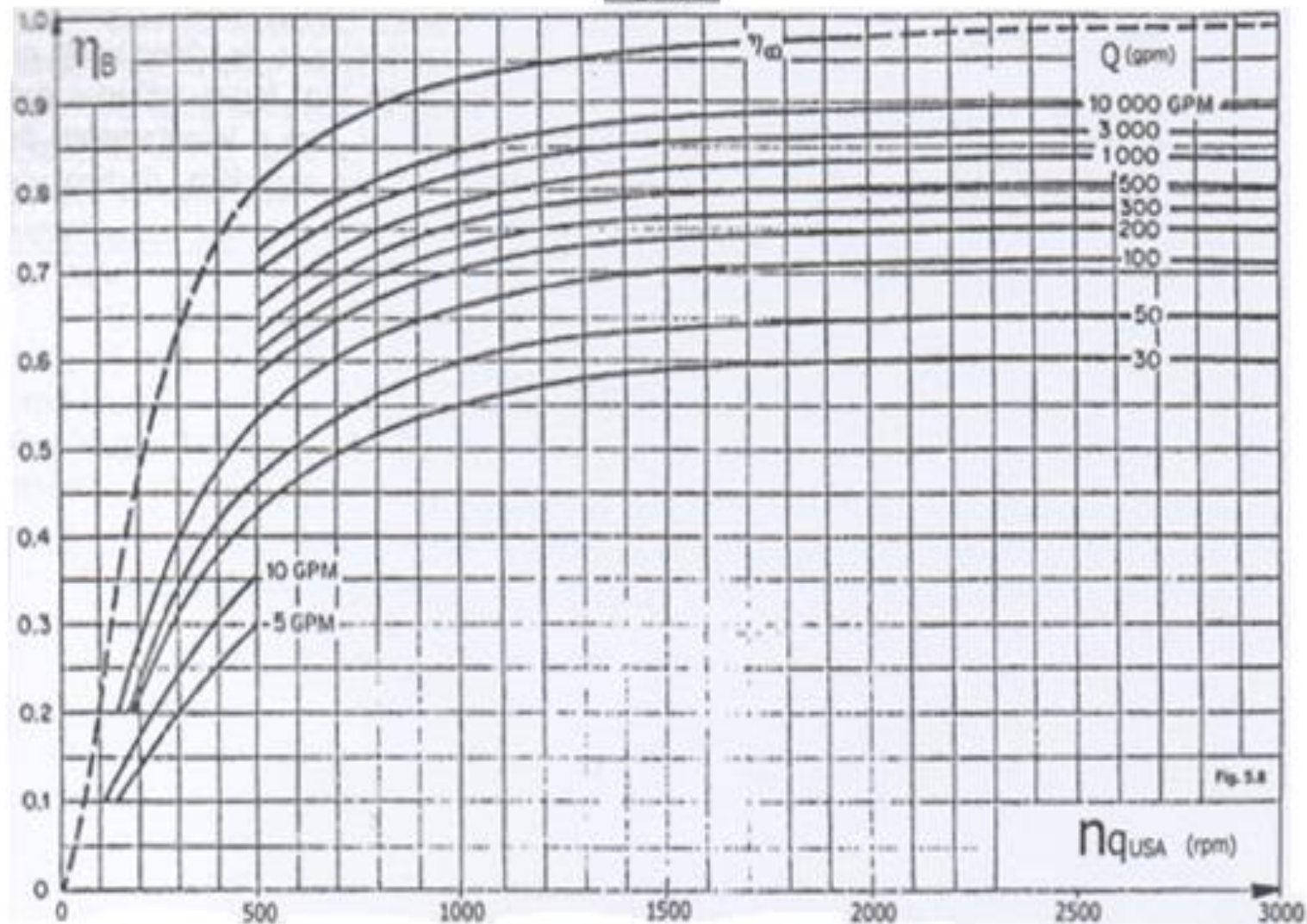


Fig. 5.8

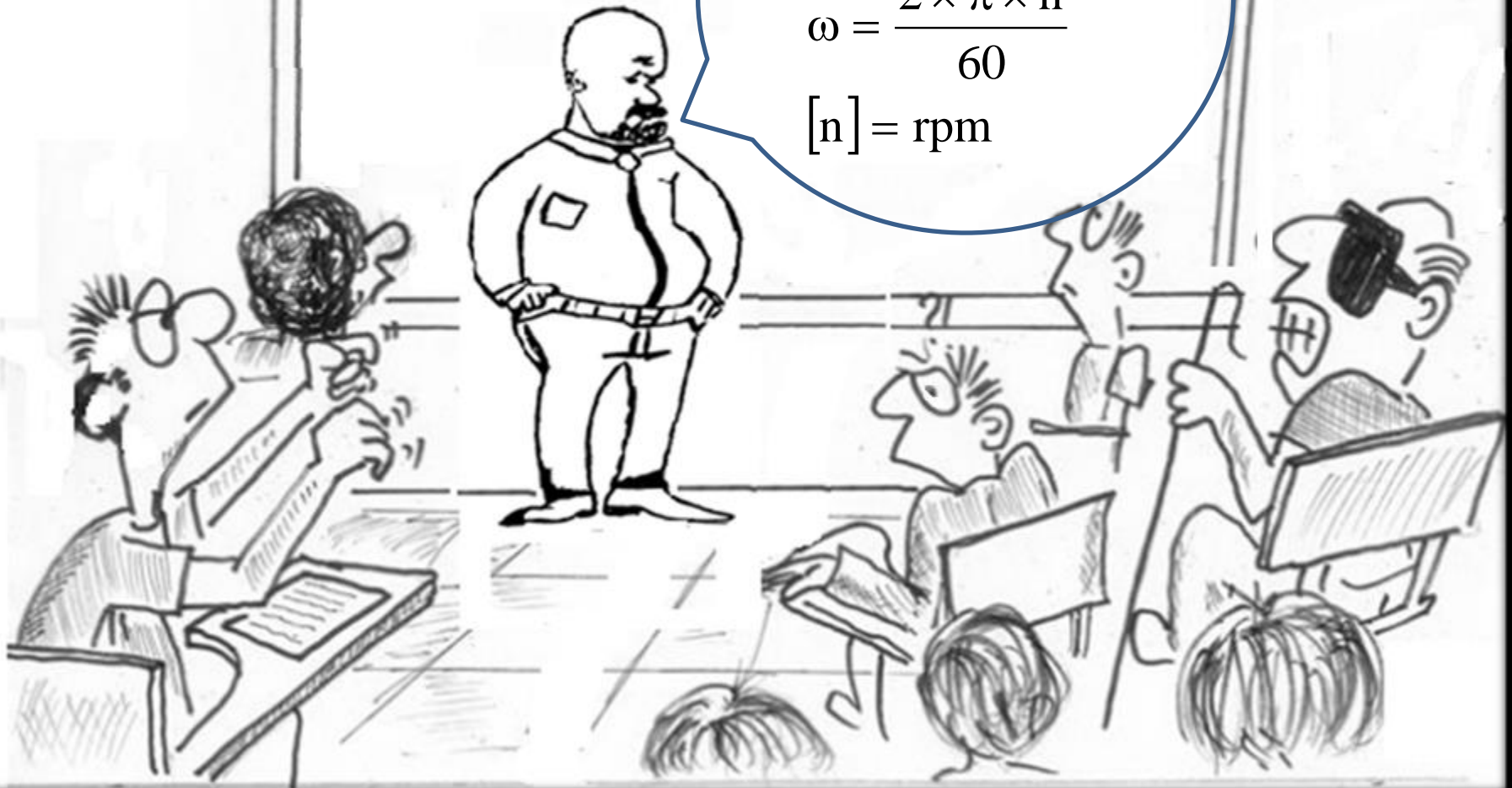
Existe um outro
diagrama que trabalha
com números
adimensionais



$$\Omega_p = \frac{\omega \times \sqrt{Q}}{\sqrt[4]{(g \times H_B)^3}}$$

$$\omega = \frac{2 \times \pi \times n}{60}$$

$$[n] = \text{rpm}$$



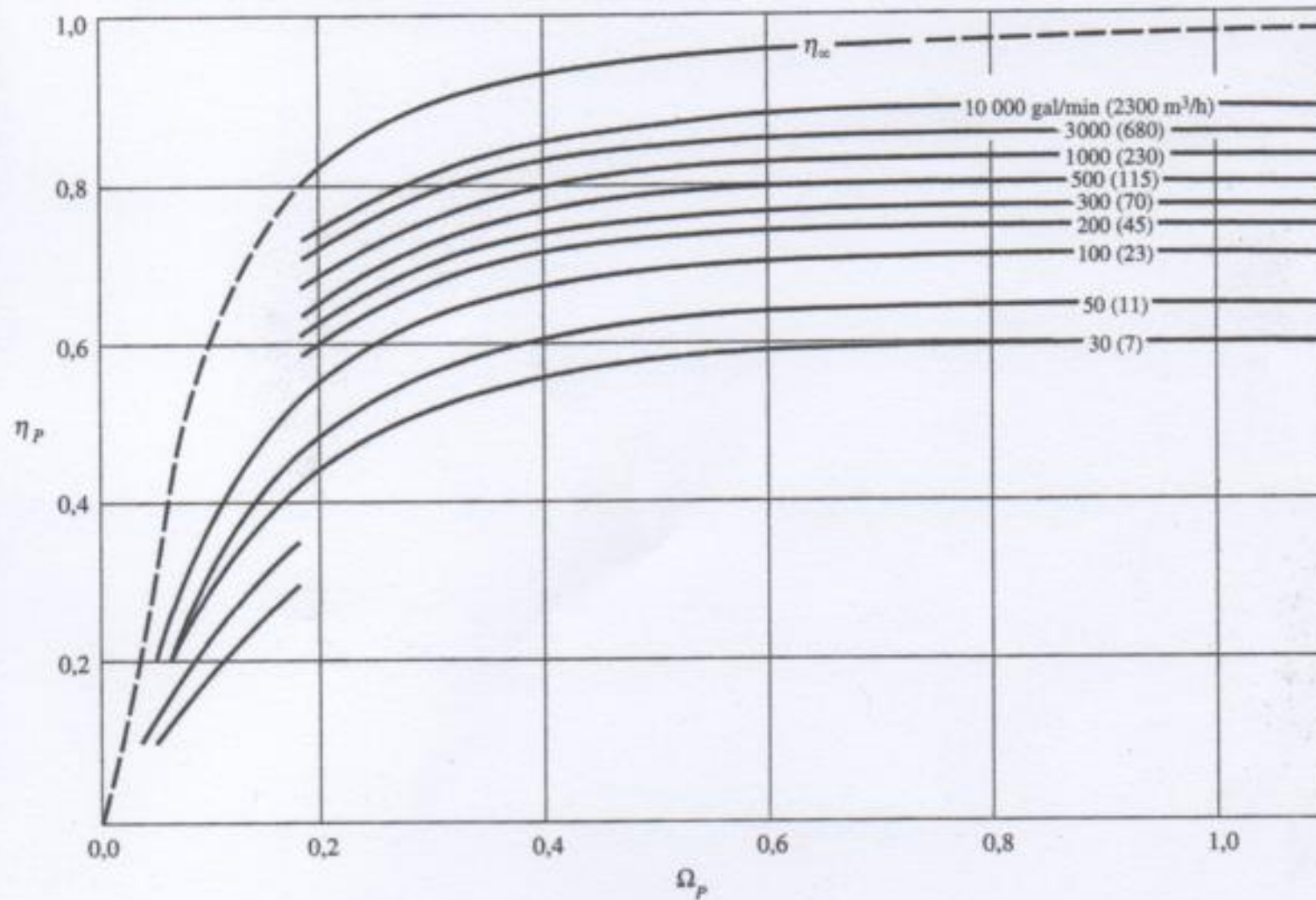


FIGURA 12.15 Eficiência máxima em função da velocidade específica e descarga para bombas de fluxo radial.
(Adaptada com autorização de Karassik et al., 1986.)

Vamos para as
avaliações
práticas!

