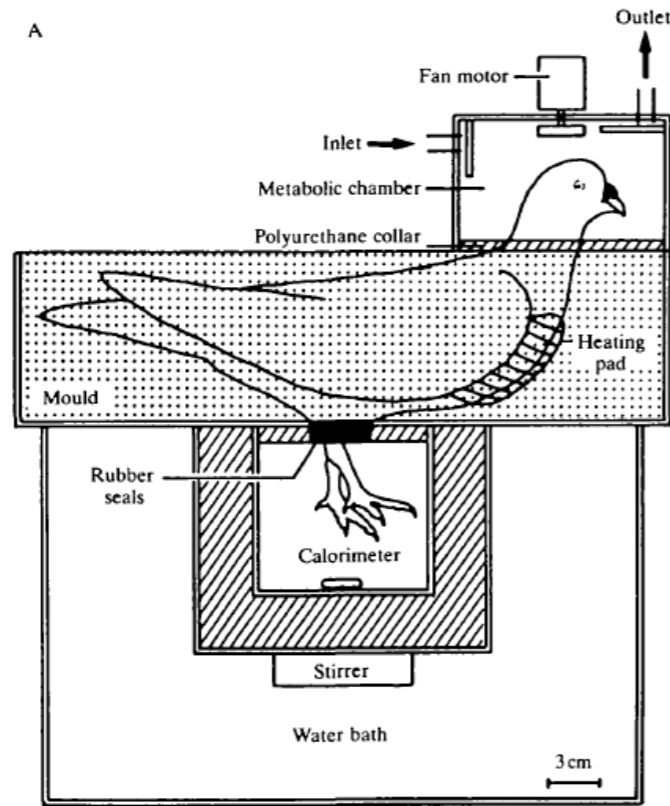
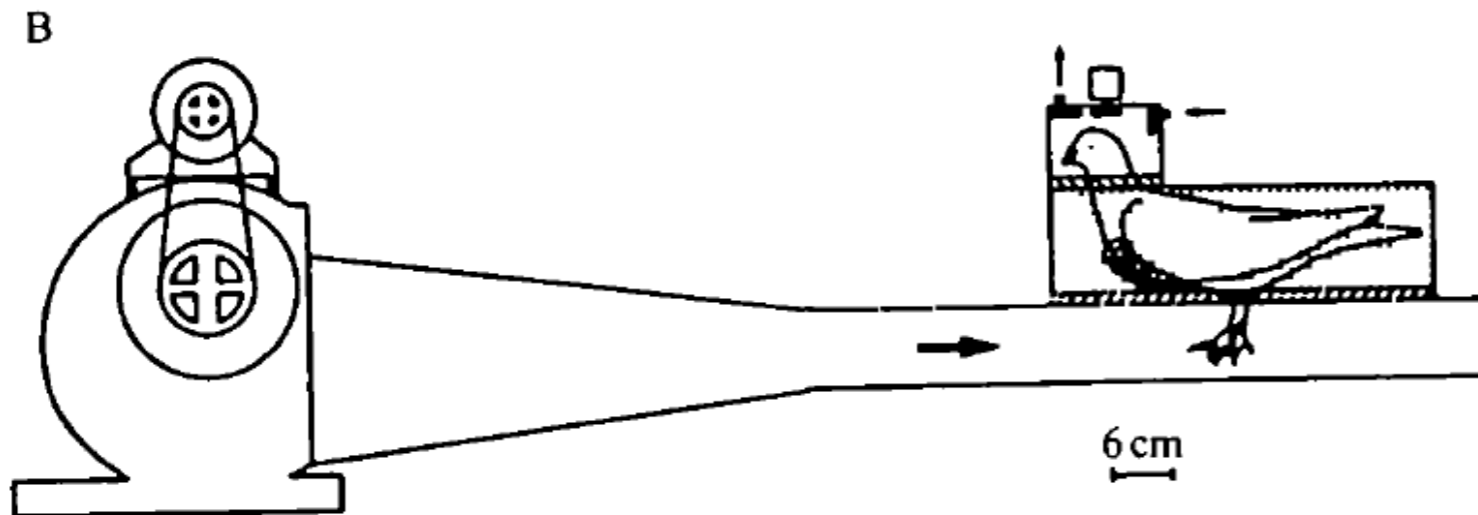
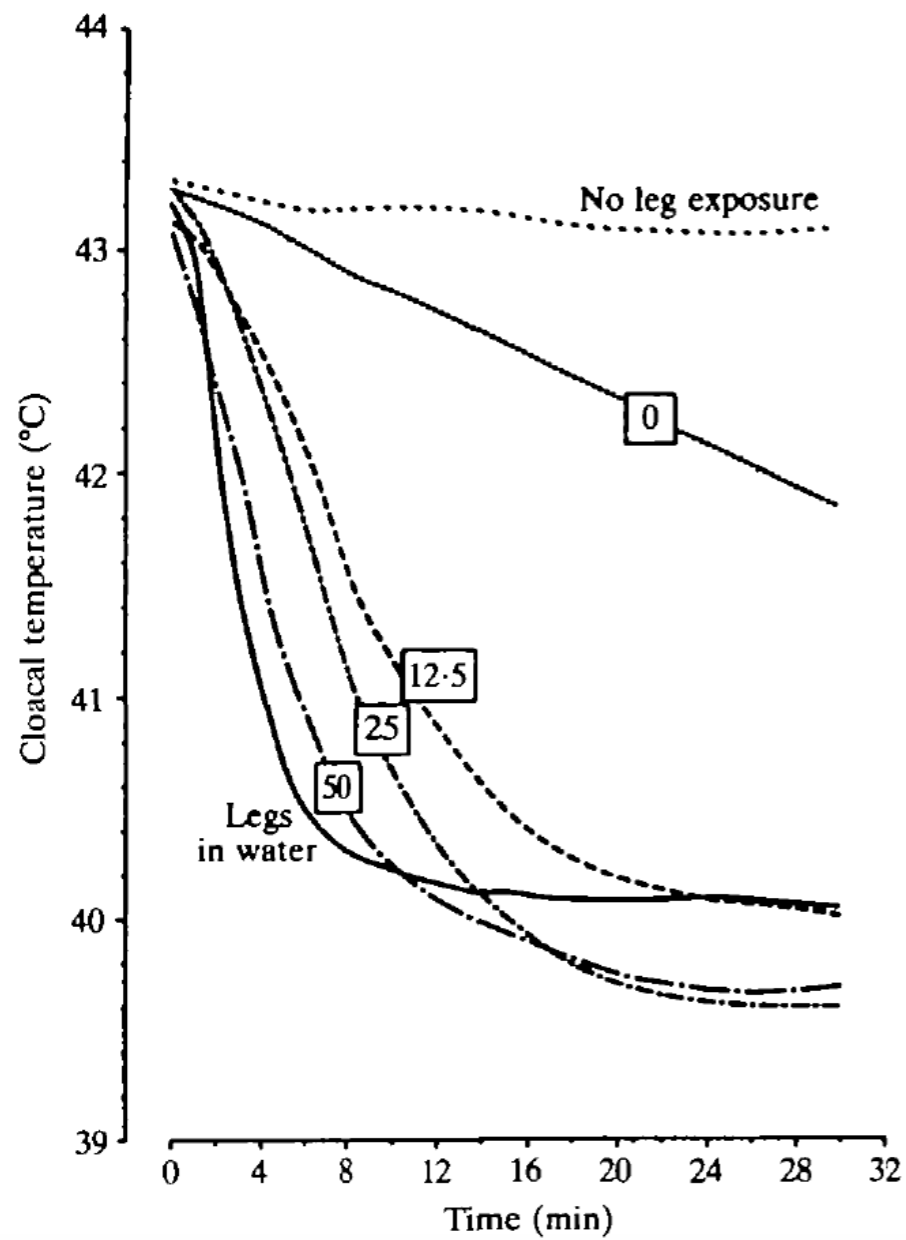


The pigeon problem

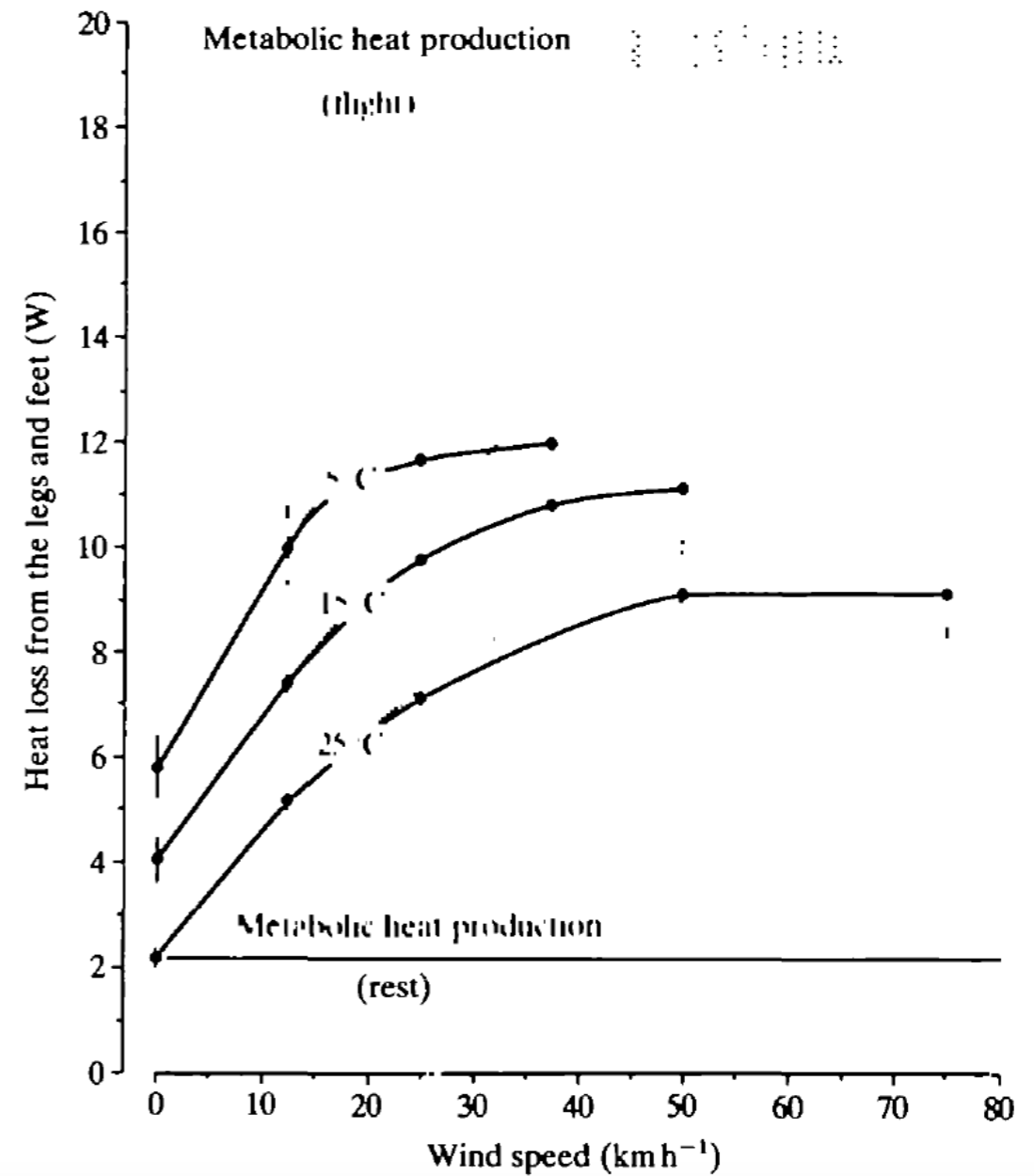


What is the cooling power of pigeon's legs ?





Internal temperature as a function of time.
 Different wind speeds
 Air and water at 25°C



Heat loss from the legs as a function of
 wind speed.
 Air at 5, 15 and 25°C

Assume : diameter of a pigeon's leg ~ a few mm
total length exposed ~ 10 cm

Estimate : Reynolds and Peclet numbers
thickness of momentum and thermal boundary layers

kinematic viscosity $\nu = 0.15 \text{ cm}^2/\text{s}$

thermal diffusivity $\kappa = 0.2 \text{ cm}^2/\text{s}$

thermal conductivity $\lambda = 2.5 \cdot 10^{-2} \text{ Wm}^{-1}\text{K}^{-1}$