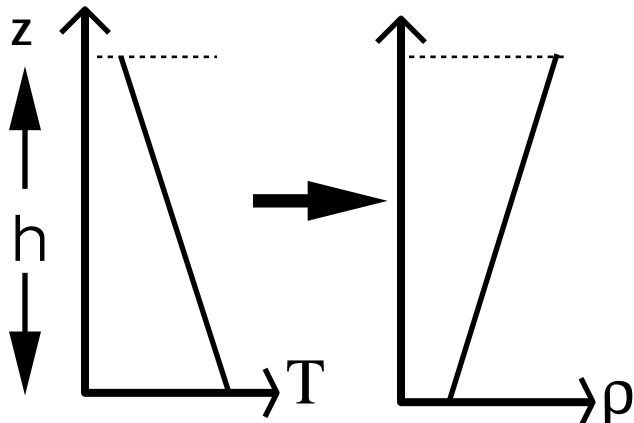


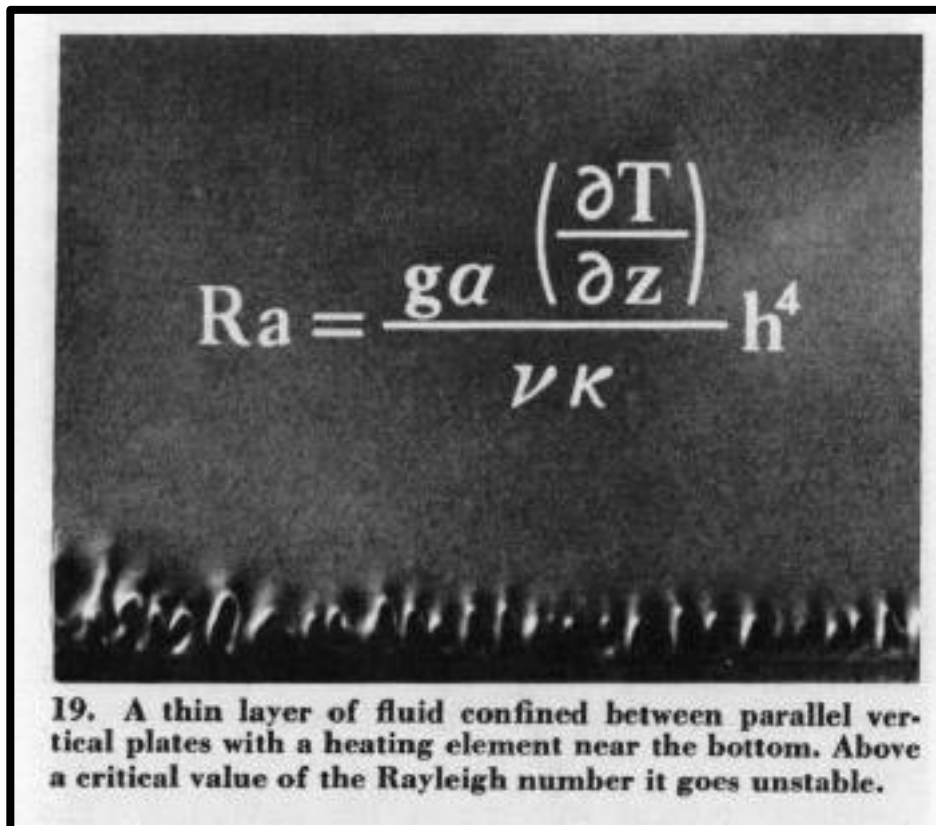
Convective Instability



If viscosity or thermal diffusivity is sufficiently large, the fluid will be conducting and stable.

Otherwise, the fluid is convectively unstable.

Onset of instability is characterised by the Rayleigh number, Ra :



ν kinematic viscosity

κ thermal diffusivity

α thermal expansion coefficient

19. A thin layer of fluid confined between parallel vertical plates with a heating element near the bottom. Above a critical value of the Rayleigh number it goes unstable.

Reproduced from "Flow Instabilities", E. L. Mollo-Christensen, in Illustrated Experiments in Fluid MEchanics, MIT Press (1972)