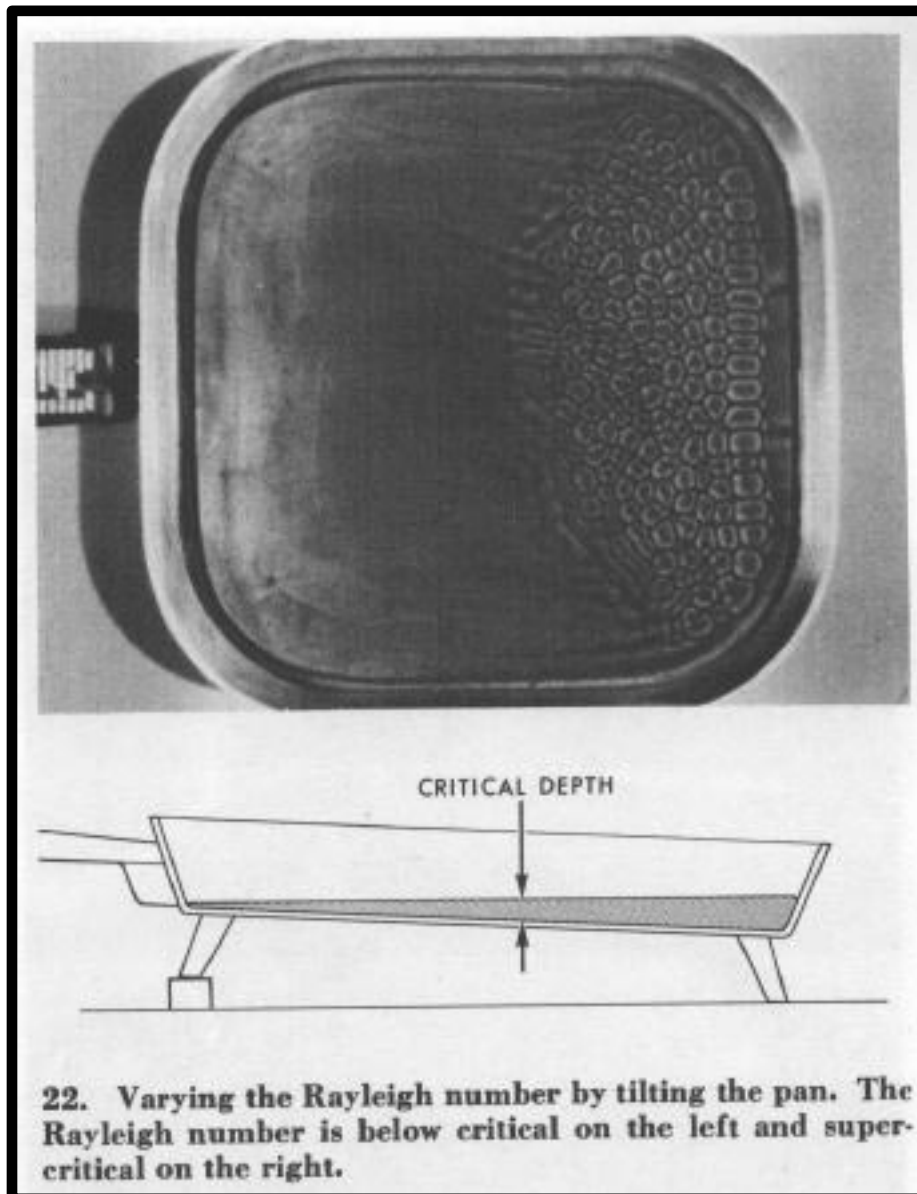# Convective Rolls

For convection with a free surface, theory predicts the critical Rayleigh number is (e.g. see Drazin & Reid (1981)):

$$R_C \sim 1101$$

In experiments (Silveston (1958)) find $R_C \sim 1700 +/- 51$

CRITICAL DEPTH

22. Varying the Rayleigh number by tilting the pan. The Rayleigh number is below critical on the left and super-critical on the right.

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