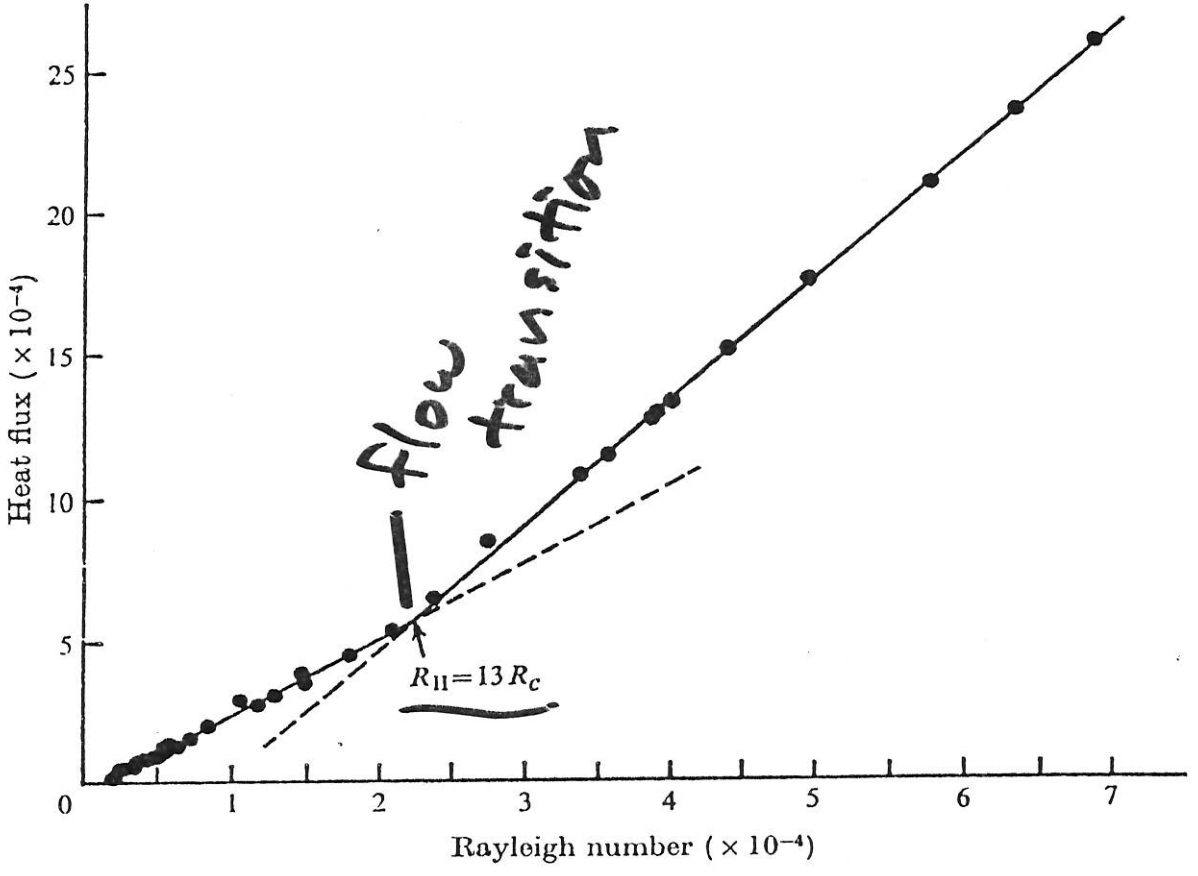


Fig. 3.11 Nusselt number (heat flux) plotted against Rayleigh number, for Prandtl number 100, from the laboratory experiments of Krishnamurti (1970a).

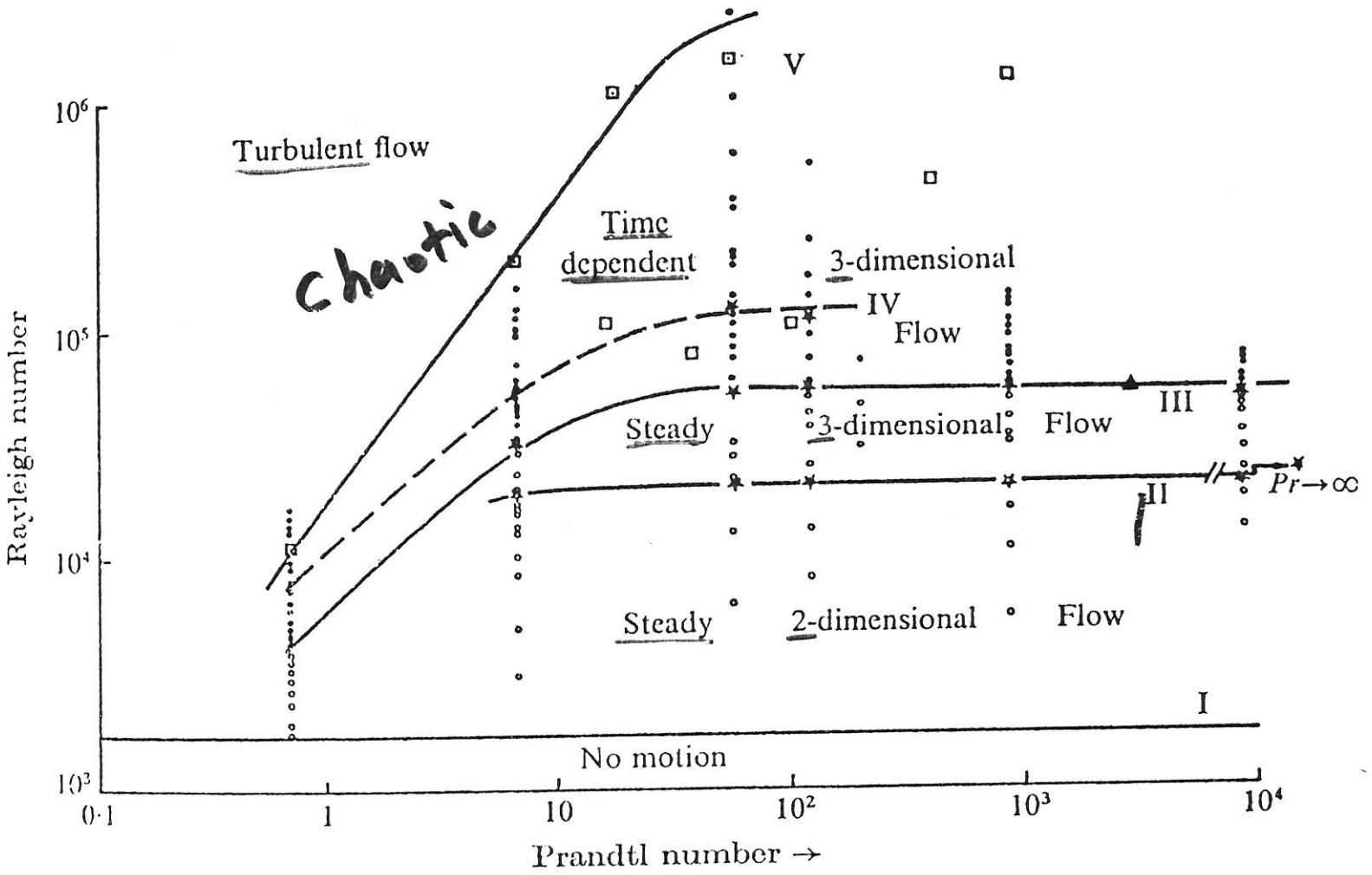


Fig. 3.12 Regime diagram for experiments on Rayleigh convection. Circles represent steady flows and circular dots denote time-dependent convection. The stars represent transition points. The open squares show independent laboratory observations of time-dependent flow by Rossby (1966) and the squares with a dot in the center show observations of turbulent flow by Willis and Deardorff (1967).

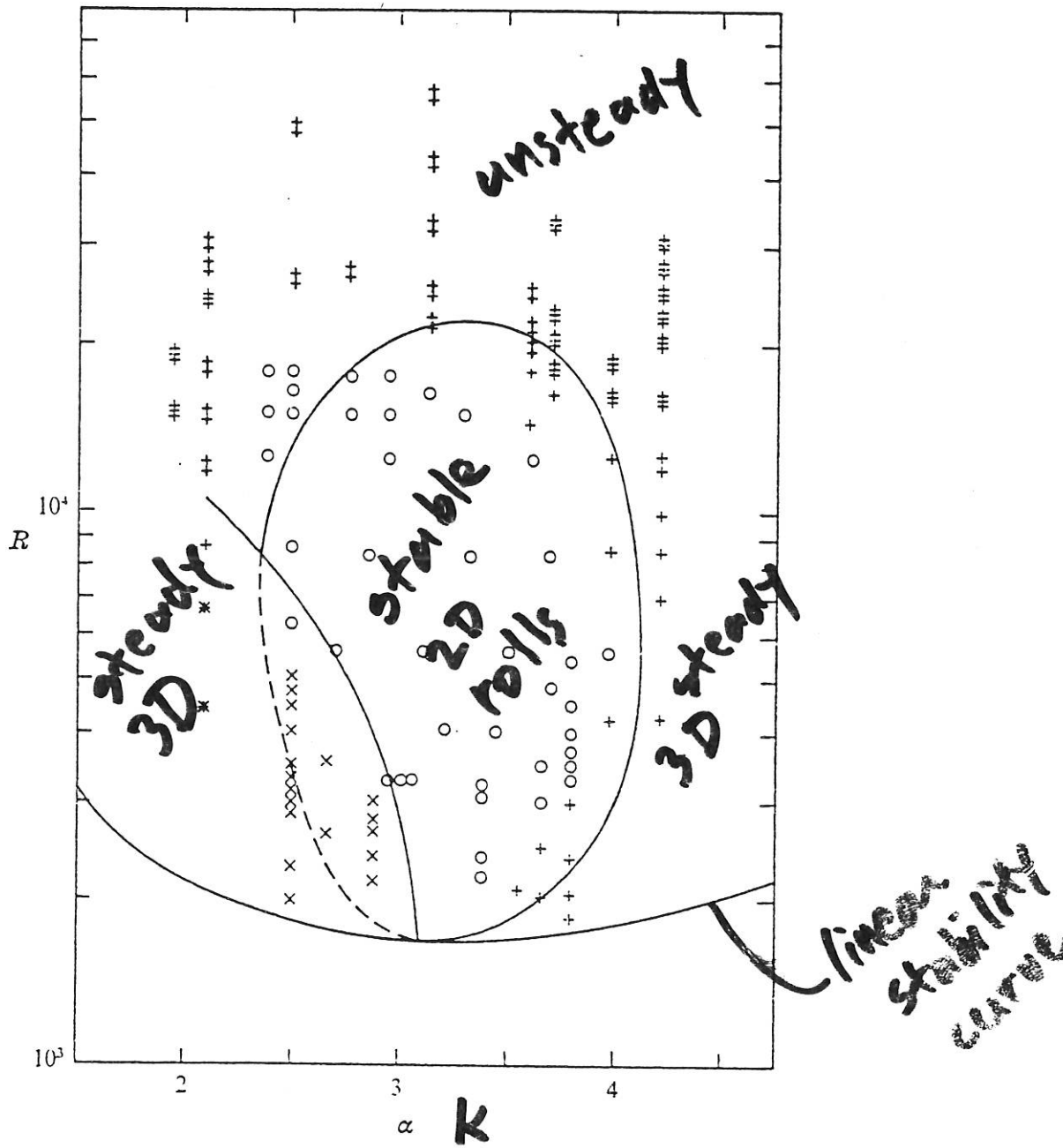


Fig. 3.13 Experimental results of Busse and Whitehead (1971) plotted on theoretical regime diagram of Busse (1967). The figure shows the Rayleigh number, plotted against horizontal wavenumber. The solid curve at bottom is the critical Rayleigh number, while the left and right curves represent the stability boundaries for zigzag and cross-roll instability, respectively. The open circles show observations of steady roll circulation, x's show zigzag instability, +'s denote cross-roll instability leading to rolls, ‡'s show cross-roll instability leading to bimodal convection, and ≠'s show cross-roll instability leading to transient rolls.

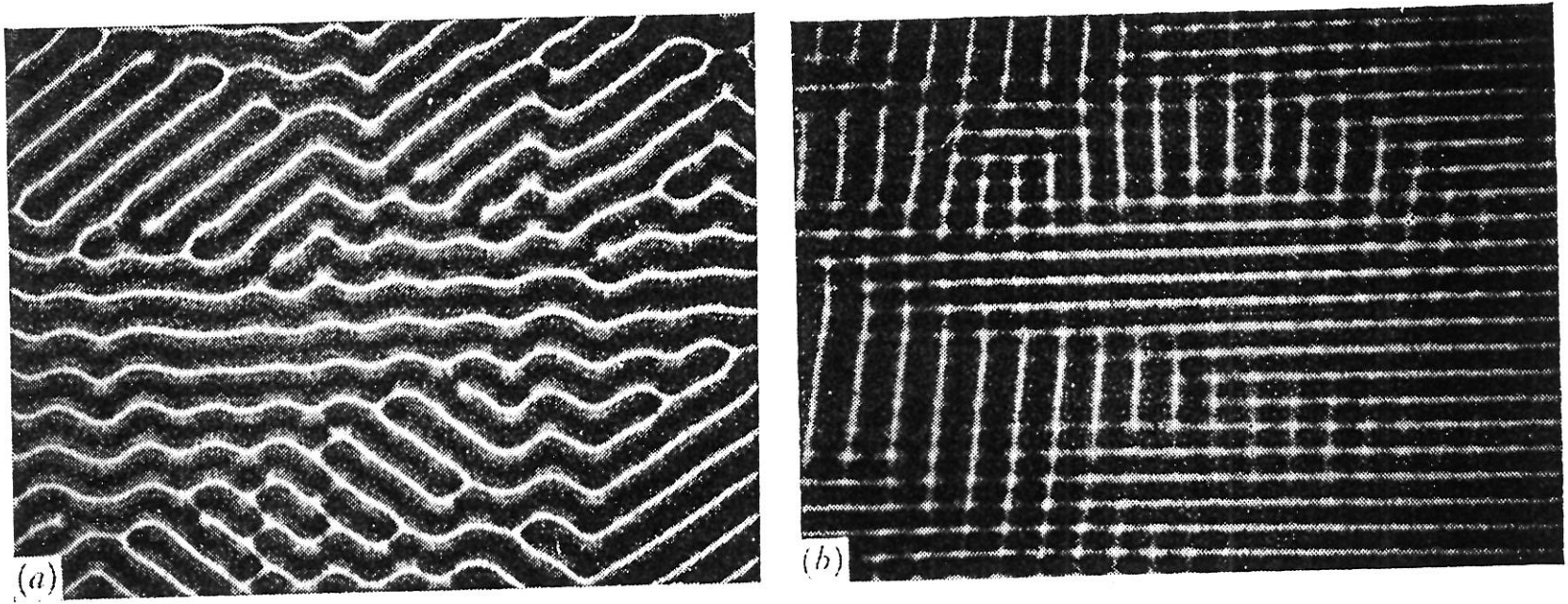


Fig. 7.5. Instability of convection rolls formed on a fluid layer held between two glass plates (*a*) the zig-zag form, (*b*) a cross-roll instability. (From Busse and Whitehead 1971.)

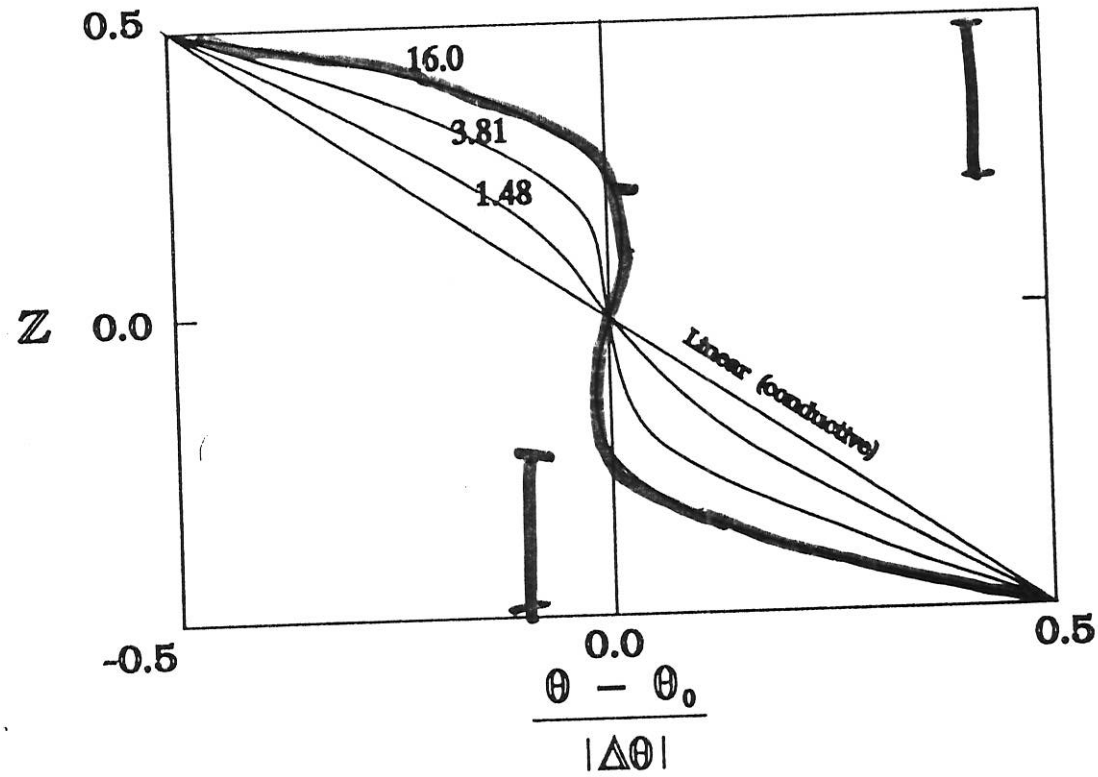
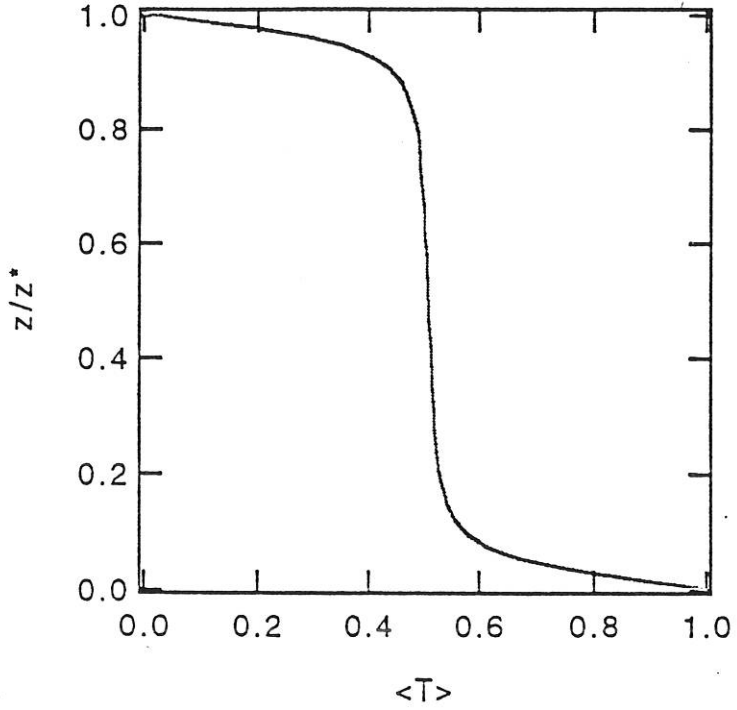


Fig. 3.14 Observed mean temperature profiles in a convecting layer. Curves are labelled with the value of R_a/R_{ac}. [*From Gille (1967).*]



Parallel Plate convection:

$Ra = 3.8 \times 10^5$

Temperature profiles

Figure 1. Mean temperature profile simulated by the dynamic linear eddy model.

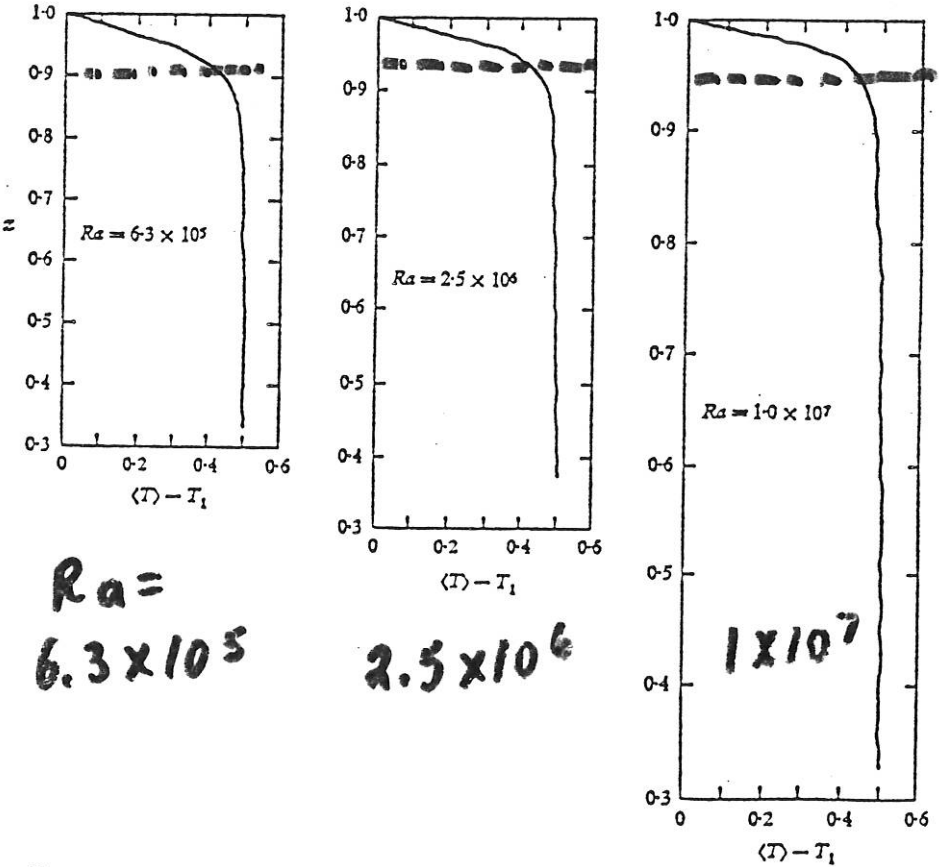
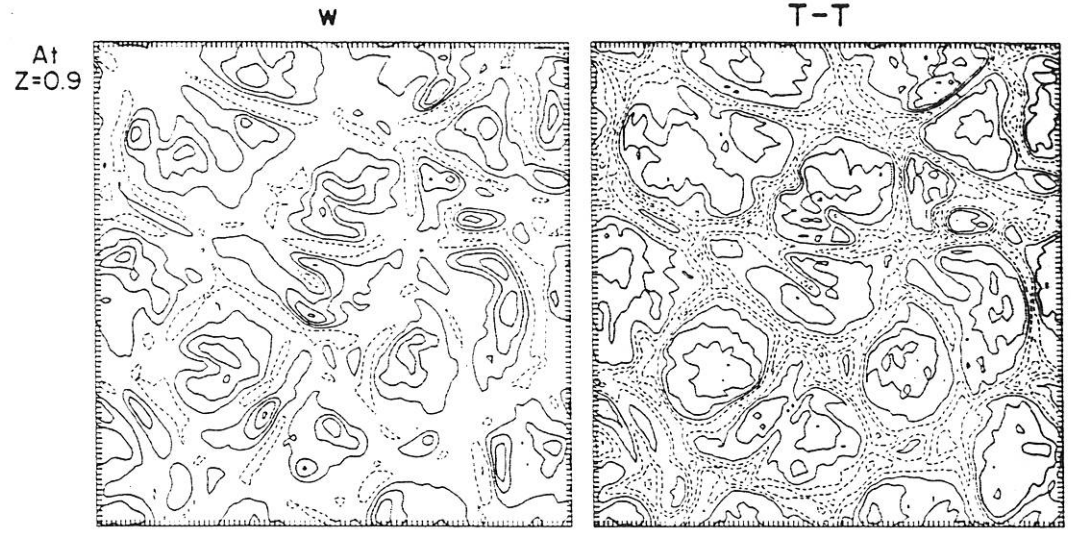


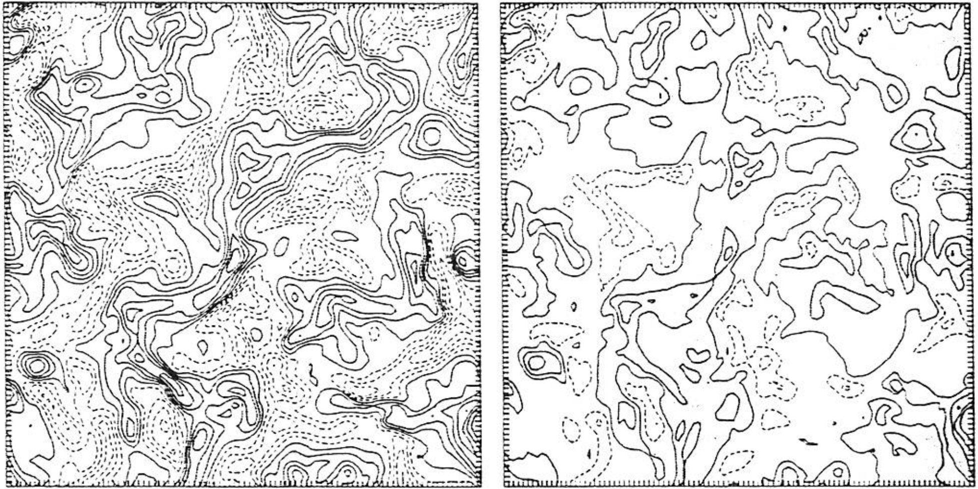
FIGURE 4. Vertical profiles of horizontally averaged temperature at three Rayleigh numbers.

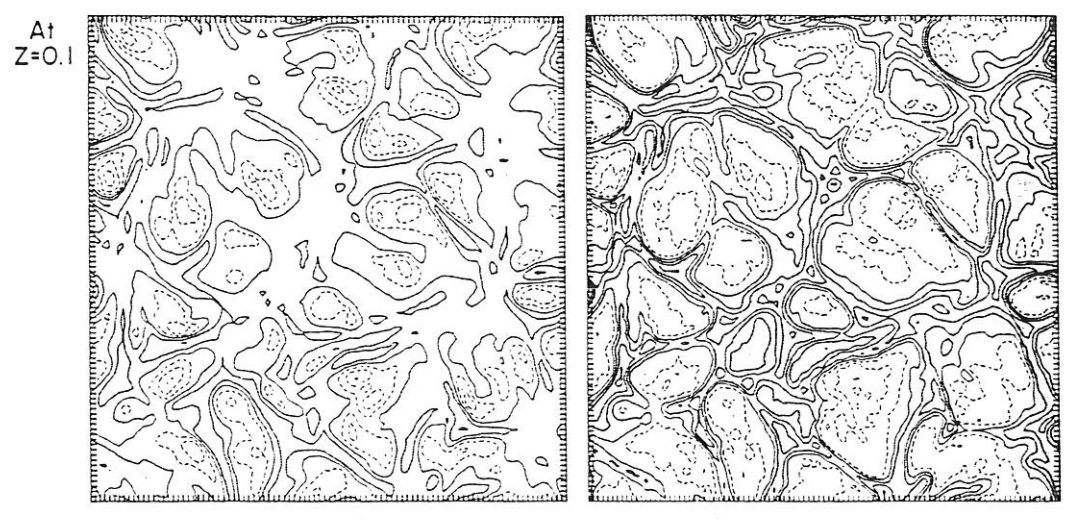
Deardorff and Willis (1967)

FIG. 3. Horizontal cross sections of w and $T - \bar{T}$ at $z = 0.9$, 0.5, and 0.1 from the simulation of Rayleigh–Bénard convection. The shaded areas indicate positive values. The solid and dashed contour lines (contour interval, 0.1) represent positive and negative values, respectively.


w
T-T
At
Z=0.9

At
Z=0.5




At
Z=0.1