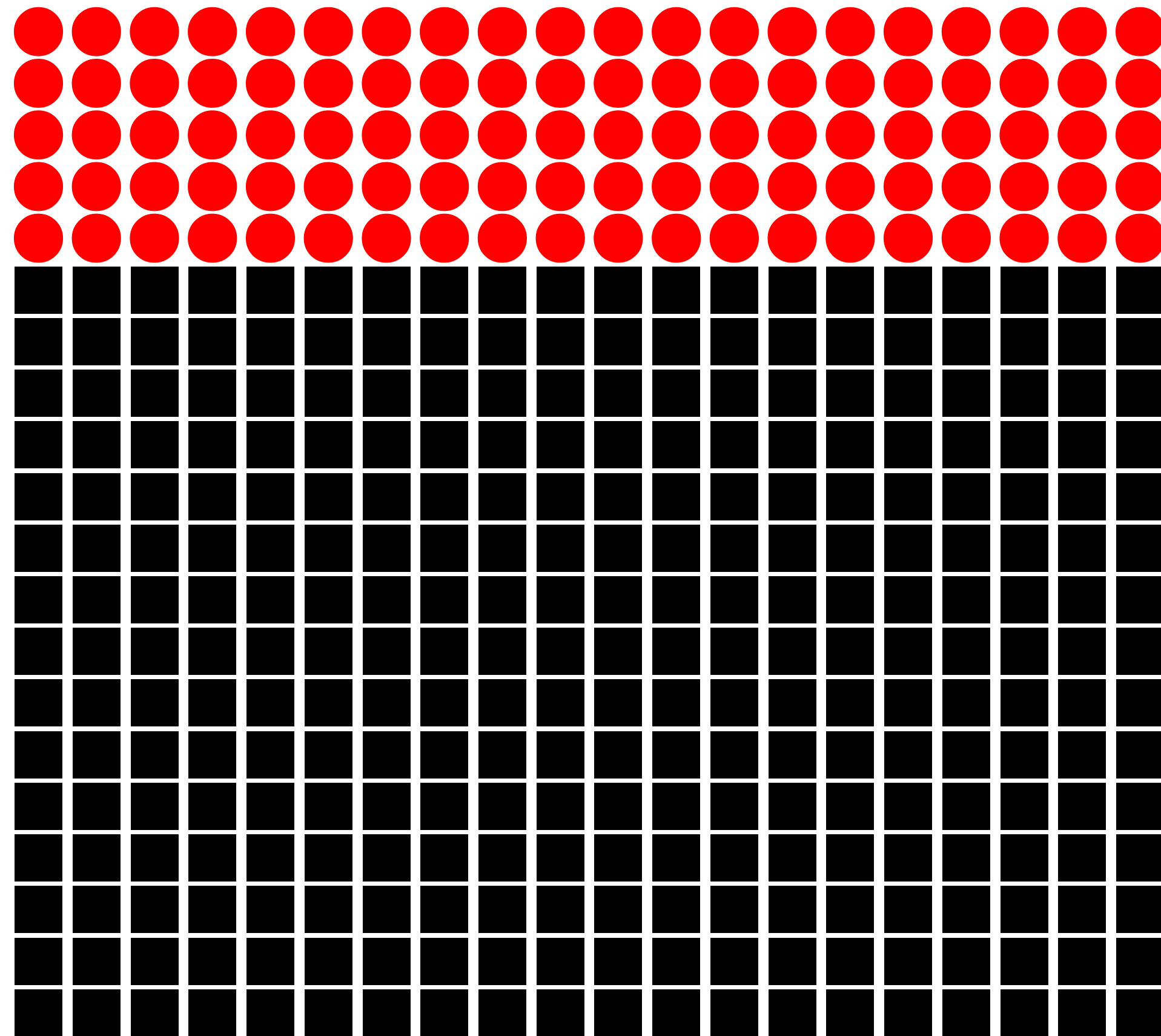
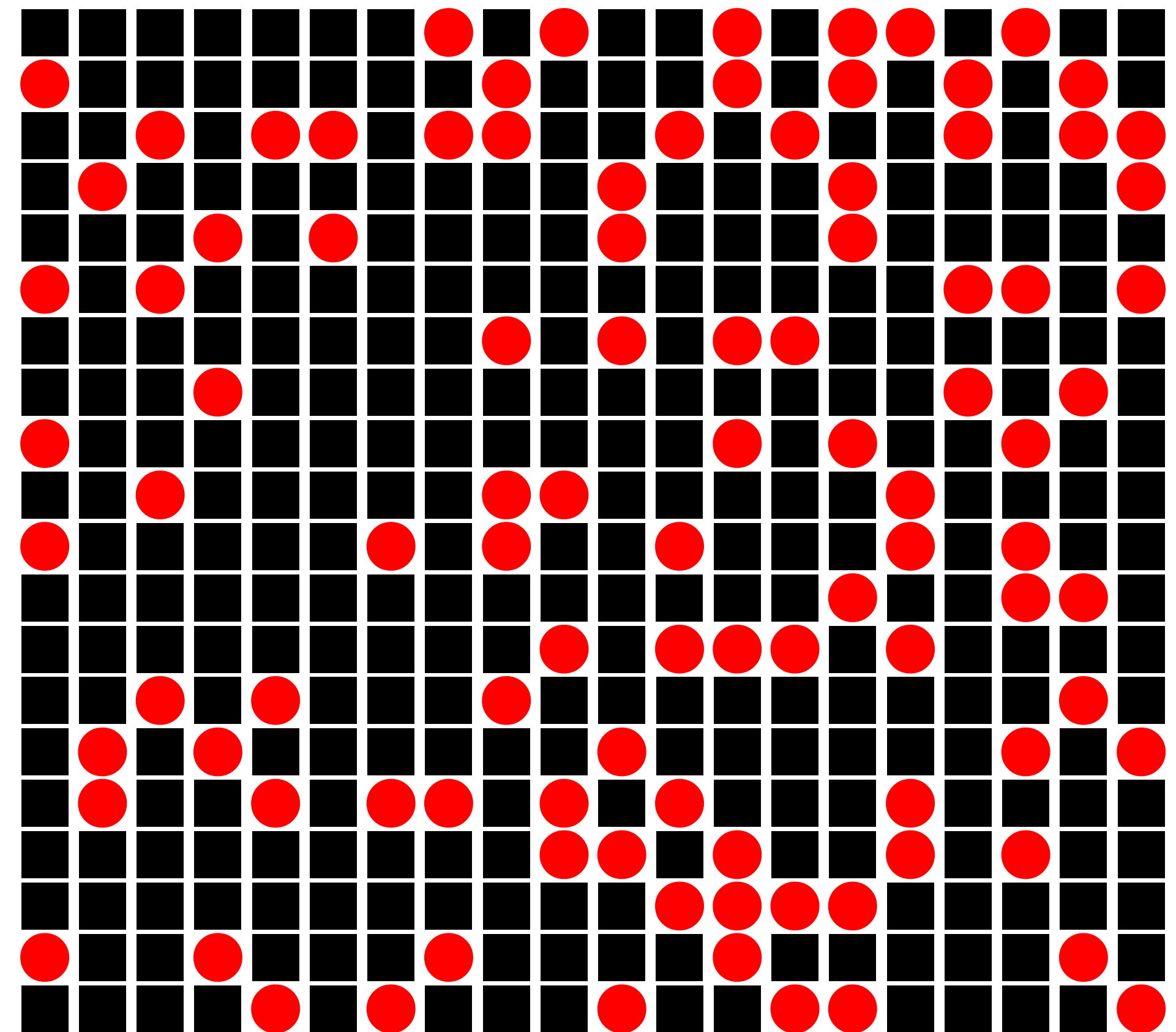


Ordered versus typical state: e^{225} states in total



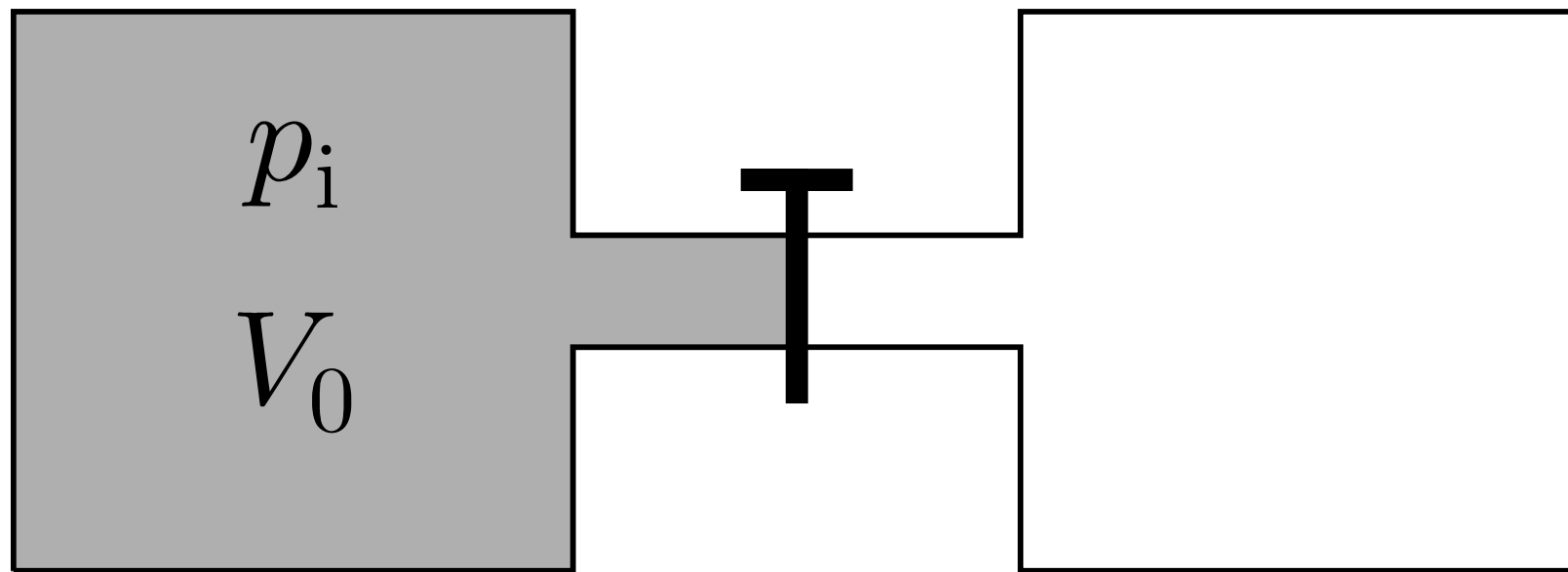
Ordered state: 400 atoms, $1/4$
are excited, $E = 100 \Delta$



a typical state: the
energy is still, $E = 100 \Delta$

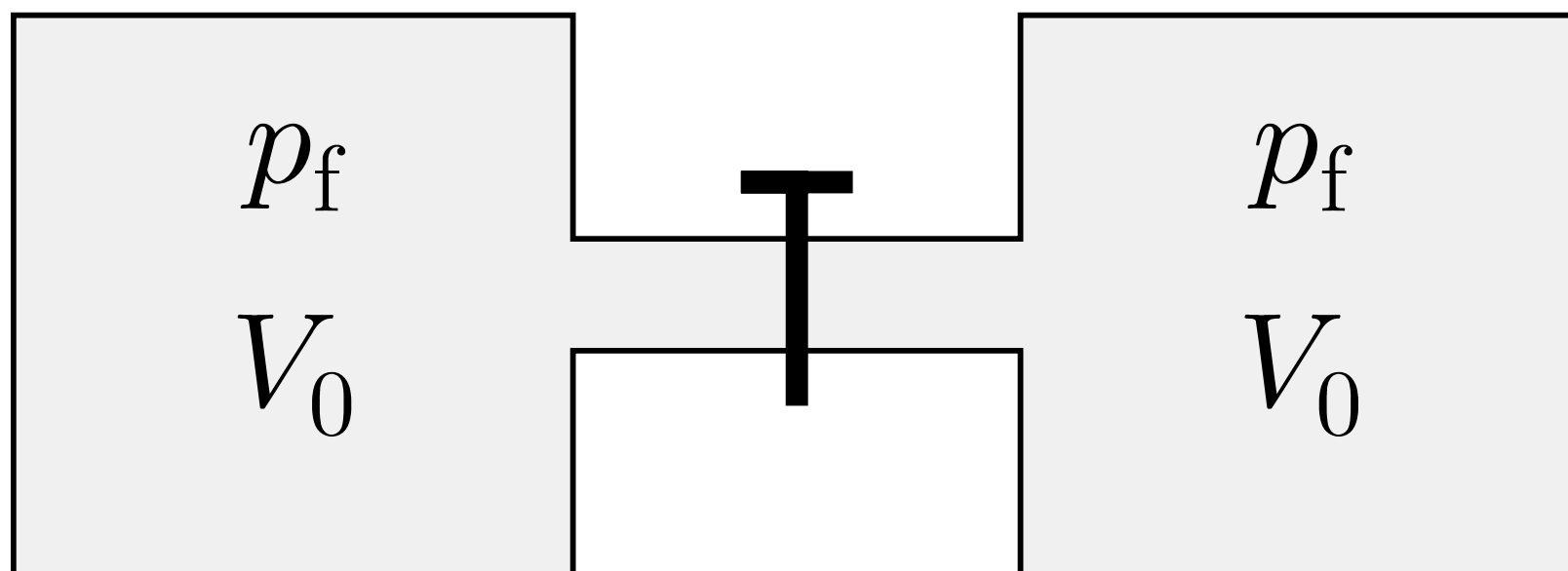
Joule Expansion

(a)



The expansion
is a highly non-equilibrium process.

(b)



During the expansion no heat
enters the system. Thus the
energy initial equals the final energy