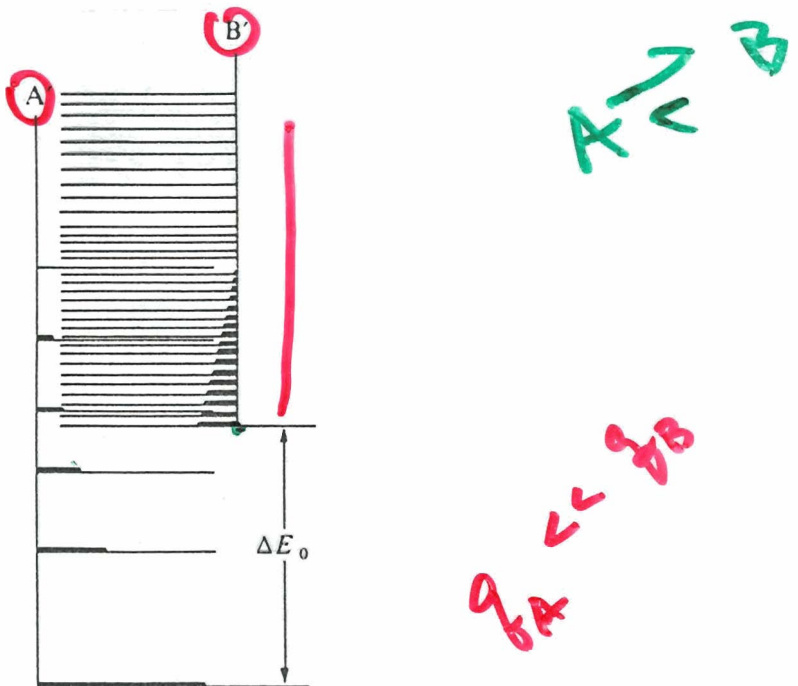


**Fig. 20.5** The array of A and B energy levels. At equilibrium all are accessible, and the equilibrium composition of the system reflects the overall Boltzmann distribution of populations. As  $\Delta E_0$  increases, A becomes dominant.



**Fig. 20.6** It is important to take into account the densities of states of the molecules. Even though B might lie well above A in energy (i.e.  $\Delta E_0$  is large and positive), B might have so many states that its total population dominates in the mixture. In classical thermodynamic terms, we have to take entropies into account as well as enthalpies when considering equilibria.