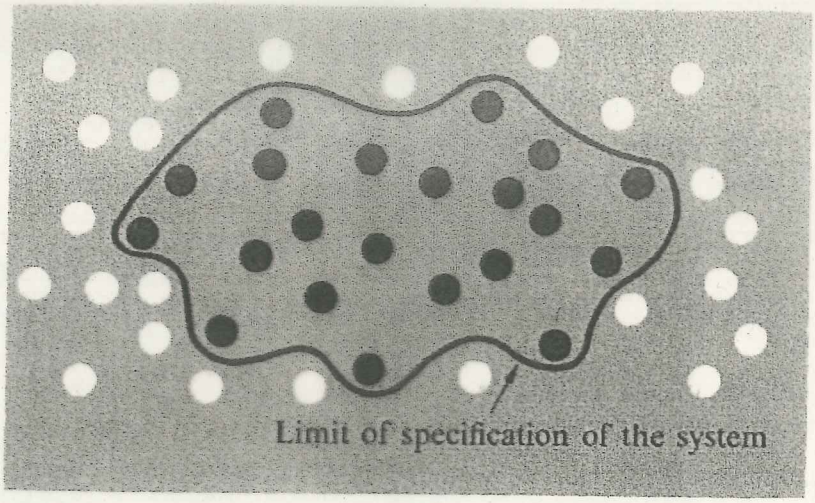

Figure 2.1 A purely symbolic diagram: each solid spot represents an accessible quantum state of a closed system. The fundamental assumption of statistical physics is that a closed system is equally likely to be in any of the quantum states accessible to it. The empty circles represent some of the states that are not accessible because their properties do not satisfy the specification of the system.

system is exactly in a stationary quantum state s, no statistical aspect is left in the problem.

PROBABILITY

Suppose we have a closed system that we know is equally likely to be in any of the g accessible quantum states. Let s be a general state label (and not one-half the spin excess). The probability $P(s)$ of finding the system in this state is

$$P(s) = 1/g \tag{1}$$

if the state s is accessible and $P(s) = 0$ otherwise, consistent with the fundamental assumption. We shall be concerned later with systems that are not closed, for which the energy U and particle number N may vary. For these systems $P(s)$ will not be a constant as in (1), but will have a functional dependence on U and on N.