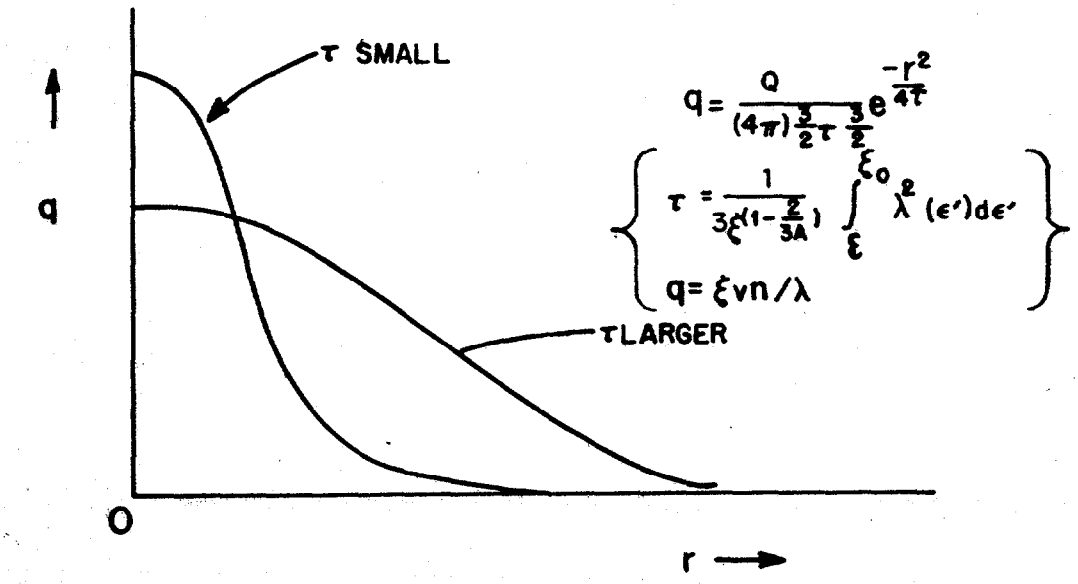

Figure 39. Point Source Solution of age equation.

distribution for the energy E gets broader and broader. This is as one would expect. Fast neutrons are distributed close to the source, and slow neutrons are spread out. (Note that the area under the curves between r and r + dr in the figure does not give the number of neutrons per unit time arriving in that interval. A factor $4\pi r^2$ must be introduced. In fact, $4\pi r^2 q\, dr$ is the number of neutrons per unit time arriving in the space interval between r and r + dr.)

In problem 5 at the end of this chapter, the average of r^2 is calculated from q. The result, 6τ, is similar to that obtained in Section 6.3.

PROBLEMS

1. Consider the collision of neutrons with beryllium. What is the average angle of scattering observed in the laboratory frame of reference? In the center of gravity system?

2. Calculate ξ for H^2, He^4, Be^9, O^{16}, U^{238}. In each case, how many collisions will be needed to reduce a neutron'd energy from 1 Mev to 1 ev?

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