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**John K McSweeney\*** ([mcsweeney@math.ohio-state.edu](mailto:mcsweeney@math.ohio-state.edu)), Ohio State University, Mathematics Department, 231 W 18th ave, Columbus, OH 43210. *Coalescence Time for a Nonuniform Allocation Process with Applications to Biology and Computer Science.*

We study a process where balls are repeatedly thrown into  $n$  boxes independently according to some probability distribution  $\mathbf{p}$ . We start with  $n$  balls, and at each step all balls landing in the same box are fused into a single ball; the process terminates when there is only one ball left (coalescence). Let  $c := \sum_j p_j^2$ , the collision probability of two fixed balls. We show that the expected coalescence time is asymptotically  $2c^{-1}$ , under two constraints on  $\mathbf{p}$  that exclude a thin set of distributions  $\mathbf{p}$ . One of the constraints is  $c \ll \ln^{-2} n$ . This  $\ln^{-2} n$  is shown to be a threshold value: for  $c \gg \ln^{-2} n$ , there exists  $\mathbf{p}$  with  $c(\mathbf{p}) = c$  such that the expected coalescence time far exceeds  $c^{-1}$ . Connections to coalescent processes in population biology (Most Recent Common Ancestor problem) and theoretical computer science are discussed. (Received September 15, 2008)