Abstract -- Barnacle embryos were reared in Millipore cytology monitors containing approximate tritiated water (HTO) concentrations of background plus $0, 10^{-5}, 10^{-4}, 10^{-3}, 10^{-2}, 10^{-1}$, and $10^0$ µCi/ml. After 32 days the cultures were fixed and the numbers of larvae counted. A “molting index,” the percentage of larvae that molted at least once, was used to evaluate the effects of HTO on normal development. Effects were observed at concentrations as low as $7 \times 10^{-6}$ µCi/ml, and were exponentially related to HTO concentration. Factors affecting sensitivity and possible environmental implications are discussed.