6. $^{14}\text{C}$ dating is the most famous radioactive dating technique used. $^{14}\text{C}$ is present in living organisms at a concentration of $1.3 \times 10^{-12}$ of $^{12}\text{C}$, and has a half-life of 5730 years. How many decays per minute are observed from a 1g of C from a living organism? How many for 1g of C from a 10,000 year-old skeleton? (Assume that the $^{14}\text{C}$ concentration was the same 10,000 years ago as it is now.)

7. It is often convenient to think of the interaction between a proton and a neutron as arising from the exchange of pion, with mass 138 MeV/c$^2$.

   (a) Give the pion exchange reactions appropriate to the p-p interaction, the p-n interaction, and the n-n interaction.

   (b) Estimate the range of the nucleon-nucleon force.