THE DISCOVERY OF SUBATOMIC PARTICLES

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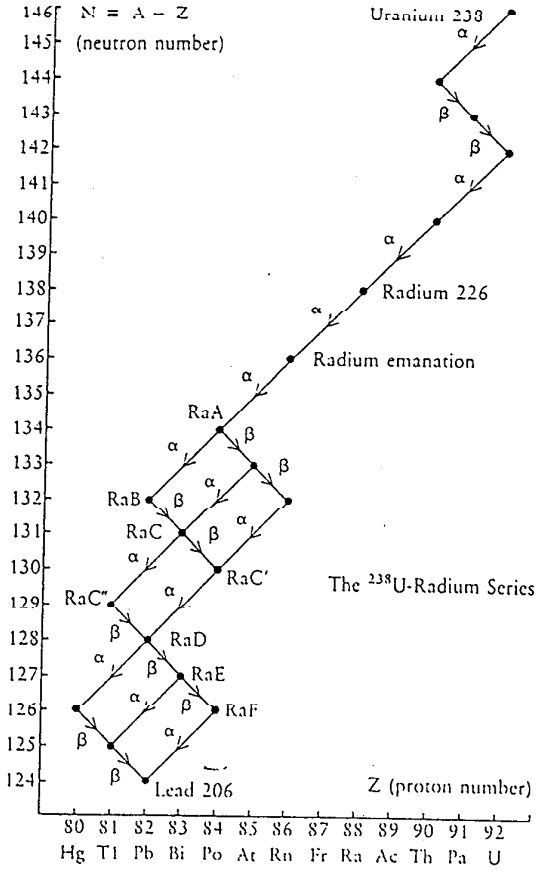

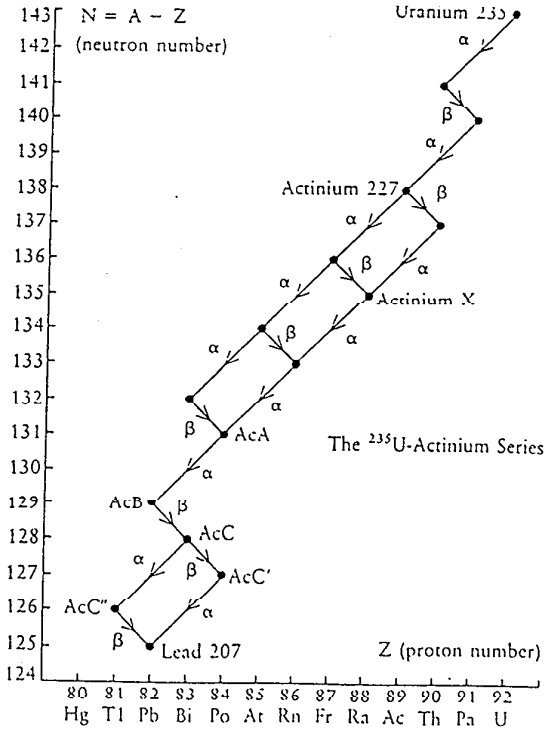

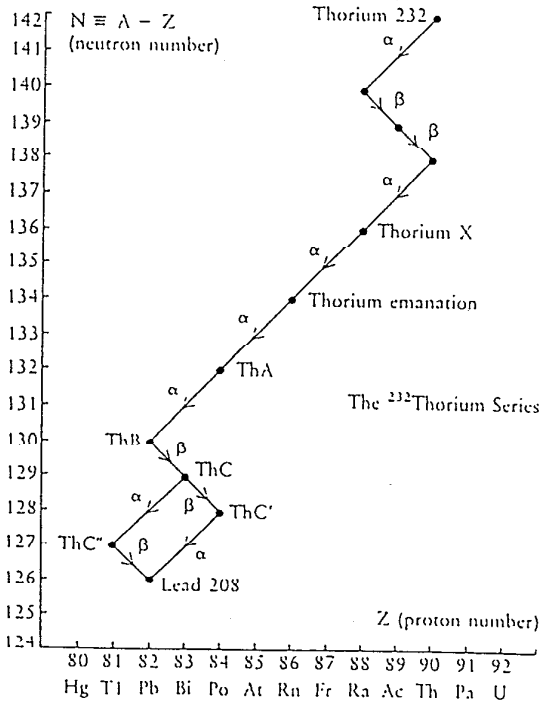

The three principal radioactive series. These figures show the nuclei produced by the three sequences of alpha and beta decays that start with the three very long-lived radioactive isotopes found in the earth: uranium 238, uranium 235, and thorium 232. The horizontal and vertical axes give the atomic number and the difference of atomic weight and atomic number, respectively; the sum of these numbers gives the atomic weight. (Equivalently, the vertical axis gives the number of neutrons; the horizontal axis the number of protons.) Alpha decays, are represented by arrows running from upper right to lower left, beta decays by arrows running from upper left to lower right. Some of the nuclei are labeled with the names given to them in the early history of nuclear physics; for instance, "radium A" is polonium 218, "thorium A" is polonium 216, and "actinium A" is polonium 215. The paths taken by the nuclear sequences shown here mark the general trend of the "stable valley" of nuclei with minimum internal energy.