the end of that time the plutonium was separated from the element 96 and the ratio of Pu^{238} to Pu^{239} determined by pulse analysis (Fig. 1). <Fig. 1 The average of several such pulse analyses gave the value 1.45 for the ratio of Pu^{238} to Pu^{239}. From these data and taking the half-life of 96^{242} as 150 days, the half-life of Pu^{238} is calculated to be 92 $\pm$ 2 years, within the limit of error of the value obtained by Jaffey(3) in direct decay measurements.

In addition to its alpha-particles 96^{242} also emits a small amount of soft electromagnetic radiation and some electrons. Absorption curves of the radiations emitted by samples of 96^{242} produced by neutron irradiation of Am^{241} are shown in figures 2,3,4 and 5. The 96^{242} in these samples <Figs. 2, 3,4,and 5 was decontaminated from rare earth fission products by means of the fluosilicate procedure mentioned above and separated from americium by selective elution from a resin (Dowex 50) adsorption column.(4) Samples from two different neutron irradiations of Am^{241} differing by a factor of approximately 3 in total number of neutrons were measured and the absorption curves were found to be identical in all respects showing that (1) the radiations are not due to fission-product contamination since the two samples had radically different chemical histories and times of decay between removal from the pile and measurement of the radiations; and (2) that the radiations are actually due to 96^{242} and not 96^{243} or a higher mass isotope since, if they were due to 96^{243}, the level of activity would have been much higher in the sample which received longer irradiation. In addition to these curves it was found by means of bending the particles in a magnetic field that approximately 12% of the counts at zero absorber are due to low energy negative electrons. These radiations and their approximate abundances are summarized in Table 1. <Table 1

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