graphite blocks seeded with uranium dioxide "eggs" and, in the center, uranium metal "eggs". We decided to try an experiment to determine the ratio of ^{239}Pu formation to ^{235}U fission* in uranium in the reactor and, if intensity of radioactivity permitted, also the yield of 7-day ^{237}U formed by the (n, 2n) reaction.

In February 1943 half of the young fission-product chemists got to see the pile when they carried over about five Spedding "eggs"–5-kilogram cylinders of uranium. These were exposed for 5 hours to the neutrons on a graphite ledge a few feet from fuel in the pile, with power level of 50 watts. A few days later the other half of the group made a visit to the pile and brought back the irradiated uranium to our laboratory. With the aid of plutonium procedures Arthur Jaffey furnished to Buck Rubinson, the ^{239}Pu was laboriously separated from the uranium and fission products. Its initial counting rate was 5×10^{-8} that of the uranium. Don Engelkemeir separated and purified the ^{239}Pu and Larry Glendenin determined the yield of 12.8-day barium-140 from which the fission rate could be established. A figure was obtained for the ratio of neutron capture rate in ^{238}U to fission rate in ^{235}U in natural uranium exposed to pile neutrons. When corrected for the modern fission yield of ^{140}Ba it was 1.4 ± 0.3, higher than the modern value by 0.4. The yield of beta-emitting ^{237}U was too low to be seen above the radiation background of freshly purified uranium. Later studies gave its yield, compared to fission, as about 0.002.

Those days on the Plutonium Project were exciting days for all of us, and two of the greatest features were the generosity of the experienced with the unexperienced and the democratic atmosphere of the whole project.

ARTHUR JAFFEY As Charles Coryell mentioned, many of us who came in the early days didn't know beans about radiochemistry, and certainly not about plutonium. Most of us hadn't had experience in radiochemical separation techniques of any sort. I spent the first month learning how to shift plutonium ions from the lower to the upper state, and trying to get rid of some of the fission products by precipitating them with lanthanum ions plus hydrofluoric acid.

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*About one atom of ^{239}Pu is formed per atom of ^{235}U undergoing fission and fission products are formed along with the plutonium. The fission products include highly radioactive isotopes of several elements. Their presence complicates the separation and recovery of plutonium from uranium since the operation must be performed remotely from behind thick shielding to protect the technicians from the radiation.