which cannot be described here because of the lack of time. These considerations are, of course, not exact and it is quite possible that negative beta particle emission will be reached as early as Cm^{247}. The considerations are negated if there should exist a pronounced closed subshell at 148 neutrons in which case the isotopes of curium above Cm^{244} might be quite short lived.

Whatever the reason for it may be, the neutron irradiations did not yield positive results, and, therefore, I will go on to describe the cyclotron irradiations by which it was finally possible in December, 1949 to identify (24) an isotope of the element with atomic number 97 as a result of the irradiation of Am^{241} with 35 Mev helium ions. This was followed within a month by the identification (25) of an isotope of element 98 through the irradiation of Cm^{242} with 35 Mev helium ions, in a research carried on by the same investigators with the addition of a young colleague, K. Street, Jr. who had already contributed very much to our knowledge of the chemical properties of the transuranium elements. The first identification experiment in the case of element 98 involved the production and separation of only a few thousand atoms. The reactions involved are summarized in the following slide (Figure 14).

$$_{95}Am^{241} + {}_{2}He^{4} \longrightarrow {}_{97}Bk^{243} + 2n$$
(4.6 hours, $K/\alpha \cong 10^3$)

$$_{96}Cm^{242} + {}_{2}He^{4} \longrightarrow {}_{98}Cf^{244} + 2n$$
(45 minutes, α)

Figure 14