dysprosium-terbium-gadolinium-europium. The spacings here reflect the relative changes in ionic radii which determine the relative separations in the ion exchange adsorption method. It can be seen that the same sequence of changes in the ionic radius is encountered on filling in the 5f electrons as occurs on filling the 4f shell, and, therefore, it seems quite clear that curium represents the midway point in the actinide transition series of elements in view of its position analogous to gadolinium.

Magnetic susceptibility measurements on compounds of the heaviest elements ideally should lead to the resultant magnetic moments in fundamental units and in this way give information on the quantum states of the responsible electrons. Actually, as encountered with the rare earth elements, the situation is rather complex and the exact behavior expected for the heaviest elements, on the basis of the presence of either 5f or 6d electrons, cannot be, or at least has not been, predicted. Nevertheless, such measurements should give, and have given, some information on this point.

The following slide (Figure 20) shows a plot comparing the room temperature experimental magnetic susceptibilities of the lanthanide and actinide cations in such a way as to show their remarkable analogy in this property. This plot is admittedly rough because data are used from both aqueous solutions and solid compounds; these are not strictly comparable and even data from different solid compounds of the same oxidation state of an element differ somewhat due to the effects of the crystal fields. Nevertheless, the comparison is sufficiently reliable to show that the magnetic measurements point toward the filling of the 5f shell in the manner expected.