29. For a given shell with quantum number n the total number of available electron states is $2n^2$. Thus, for the first four shells ($n = 1$ through 4) the number of available states are 2, 8, 18, and 32 (see Appendix G). Since $2 + 8 + 18 + 32 = 60 < 63$, according to the "logical" sequence the first four shells would be completely filled in an europium atom, leaving $63 - 60 = 3$ electrons to partially occupy the $n = 5$ shell. Two of these three electrons would fill up the $5s$ subshell, leaving only one remaining electron in the only partially filled subshell (the $5p$ subshell). In chemical reactions this electron would have the tendency to be transferred to another element, leaving the remaining 62 electrons in chemically stable, completely filled subshells. This situation is very similar to the case of sodium, which also has only one electron in a partially filled shell (the $3s$ shell).