form was known for all the R_2O_3 compounds but the monoclinic form was known only for the lighter elements from La to Dy. The heavy element sesquioxides were converted from the cubic form to the monoclinic modification by application of high pressure, high temperature techniques by Hoekstra (3).

The only other rare earth series which have been studied under high pressure, high temperature conditions are the monotellurides by Rooymans (4) and a study on the phosphates, arsenates, vanadates, tantalates and niobates by Stubican and Roy (5). New polymorphs of known compounds were found in both of these studies.

An examination of crystal structure and density data for rare earth sesquisulfides (2), (6) showed that the monoclinic form was known for all the rare earths but in this case the cubic form was more dense and was known only for the lighter elements La through Dy. Also the coordination number of eight in the cubic form is higher than the six coordinated monoclinic form (7).

Since high pressure favors the more dense and higher coordinated structure it seemed probable that the conversion from monoclinic to the cubic form could be carried out for the heavy rare earths by application of high pressure, high temperature techniques. In the present work the monoclinic form of Ho_2S_3, Er_2S_3, Tm_2S_3 and Y_2S_3 were all converted to the Th_3P_4 type cubic structure at about 75 kilobars and 2000 °C. Orthorhombic Yb_2S_3 was also