error until the best indexing was obtained consistent with all the patterns. Lattice parameters were calculated by using a least squares analysis of the relation for orthorhombic systems given in equation 2. Then all possible d values were calculated from these lattice parameters using the parameters and the assigned Miller indicies in equation 2. The observed d values were compared to the calculated values and the assigned hkl values were adjusted for best agreement and lattice parameters were recalculated. This procedure was repeated several times until no futher improvement between calculated and observed d values could be obtained. The indexings thus obtained are given in Table 11 in the Appendix.

The cubic Th_3P_4 type patterns obtained in the sesquisulfides were indexed directly from the d values by the method outlined by Azaroff and Buerger (29) using the relation for isometric systems given in equation 1. Lattice parameters were calculated by a least squares analysis of the observed d values and the assigned Miller indicies.

The calculated and observed d values and hkl values for all compounds studied are given in Tables 10, 11 and 12 in the Appendix. The lattice parameters are summarized in Tables 5 and 6. The variation of lattice parameters of the $LaSb_2$ type is shown in Figure 19. Data of Wang and Steinfink are also included (1). The present data seem to fit quite