odicity act to increase the relative importance of the weak beams so that the condition of two strong beams may never be reached.

Excellent examples of thick-crystal patterns have been given by Uyeda & Nonoyama (1966*a*, *b*) showing the conditions of two diffuse regions. Furthermore they found that anomalous transmission did not occur in thick specimens which contained high dislocation densities. More realistic calculations take into account the non-systematic interactions, which themselves introduce absorption (Gjønnes, 1962). Without additional absorption processes these effects can partially reverse at another thickness as pointed out by Hall & Hirsch (1965). However in general, and for example particularly near a high-order zone axis (*e.g.* Fig. 10, Goodman & Lehmpfuhl, 1968) a total damping is produced, *i.e.* the energy never returns to the central beam. The intensity remaining distributed between the weak beams is therefore relatively more significant than in the systematic case. A detailed investigation of this problem for different structures has recently been concluded by Fisher (1968).

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Thermal expansion of strontium sulphide, SrS and strontium chloride, SrCl$_2$.

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Accurate values of the lattice constants of SrS and SrCl$_2$ have been determined at different temperatures in the ranges 30–273°C and 26–294°C respectively. The coefficients of lattice thermal expansion, obtained from these data, could be expressed by:

$$\text{SrS}: \alpha_t = 9{\cdot}26\times10^{-6} + 3{\cdot}36\times10^{-8}t + 1{\cdot}11\times10^{-12}t^2$$
$$\text{SrCl}_2: \alpha_t = 20{\cdot}80\times10^{-6} + 11{\cdot}29\times10^{-9}t + 46{\cdot}60\times10^{-12}t^2,$$

where α_t is the coefficient of thermal expansion at t°C.

Lack of experimental data in the literature on the thermal expansion of strontium sulphide (SrS) and strontium chloride (SrCl$_2$), led the authors to undertake a study of the temperature variation of the lattice constants and the coefficients of thermal expansion of these crystals. Conventional methods, involving the use of (i) X-ray back-reflexion powder photography, (ii) least-squares treatment of the film data and (iii) statistical analysis of the results, were employed to obtain precision values of the lattice constants at different temperatures along with estimates of the limits of errors (Deshpande & Mudholker, 1960; Deshpande & Khan, 1963; Jette & Foote, 1935).

SrS (NaCl type) was studied at seven different temperatures between 30° and 273°C. Strontium chloride, which is usually obtained in the hydrated form (SrCl$_2$.6H$_2$O, trigonal), had to be heated at 300°C for about three hours to give the anhydrous powder (cubic, CaF$_2$ type). This powder was packed in the specimen holder of the camera and kept well protected from atmospheric moisture during exposures. Pictures were taken at eleven different temperatures between 26° and 294°C.

Table 1. *Values of the lattice constants of* SrS *and* SrCl$_2$ *at different temperatures*

SrS		SrCl$_2$	
Temperature °C	*a*	Temperature °C	*a*
30	6·0233 ± 0·0004 Å	26	6·9792 ± 0·0005 Å
62	6·0249	54	6·9833
92	6·0273	74	6·9868
129	6·0302	87	6·9896
159	6·0326	112	6·9933
230	6·0395	130	6·9956
273	6·0440	164	7·0019
		217	7·0098
		246	7·0158
		273	7·0203
		294	7·0241

Table 1 gives the values of the lattice constants of the two crystals at different temperatures along with the estimated accuracies. The coefficients of thermal expansion were obtained by the method suggested by Deshpande & Mudholker (1961) and could be expressed as follows:

$$\text{SrS}: \alpha_t = 9{\cdot}26\times10^{-6} + 3{\cdot}36\times10^{-8}t + 1{\cdot}11\times10^{-12}t^2$$
$$\text{SrCl}_2: \alpha_t = 20{\cdot}80\times10^{-6} + 11{\cdot}29\times10^{-9}t + 46{\cdot}60\times10^{-12}t^2\,.$$

Here α_t is the coefficient of thermal expansion at t°C.

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