only one orientation ($mm = mm2$). Hermann's *Hexagonales System* contains the *h* lattice symmetry and its 15 proper subgroups; his *Rhomboedrisches System* likewise contains the *r* holohedry with its four proper subgroups, and only crystals with a rhombohedral lattice belong to the rhombohedral system. A step backwards was taken in 1952, when this logical and elegant presentation was dropped from the *IT* (1952) to make room for the ill-conceived 'trigonal system'.

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Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

Rare gas solids. Vol. II. Edited by M. L. KLEIN and J. A. VENABLES. Pp. xiv + 643. London: Academic Press, 1977. Price £26.00, $50.75.

The study of rare gas solids has posed a challenge to experimentalists and theoreticians ever since their existence was firmly established approximately one hundred years ago. The experimental difficulties center around the extreme conditions of low temperature and high pressure (for helium) needed to attain and preserve the solid state in these materials, while the theoretical problems are related to the search for suitable quantitative expressions which can adequately describe the interatomic forces responsible for the formation of crystalline rare gases. Equally perplexing are the questions why only specific crystalline phases are formed by these solids and why solid–solid phase transitions occur [as was discussed in the short review of Volume I of this two-volume book which appeared in *Acta Cryst.* (1977), A**33**, 526]. Volume I is largely confined to the theoreticians' account, while Volume II, in which the pagination follows sequentially that of Volume I, contains the experimentalists' contributions.

This volume consists of ten excellent chapters written by fifteen authors. However, a glaring omission is the absence of a comprehensive chapter devoted to a description of the extensive low-temperature X-ray investigations into the structures of the rare gas solids. These materials have been studied by X-ray diffraction techniques for over 50 years, starting with the study of argon in 1924 and continuing today with measurements taken at 30 mK. Unfortunately, in this book the fragmented description of diffraction studies is scattered throughout several chapters. Three chapters should be of special interest to the readers of this journal: *Crystal Growth* (J. A. Venables and B. L. Smith), *Neutron Scattering* (B. M. Powell and G. Dolling), and *Brillouin Spectroscopy* (B. P. Stoicheff).

The chapter on crystal growth (which also includes a discussion of crystal defects) discusses techniques that have been developed for growing crystals from the vapor and from the liquid (at both low and high pressures). Also included is a description of the influence of crystal imperfections (impurities and structural faults) on experimental measurements.

The first third of the neutron scattering chapter describes the principles and techniques of neutron spectroscopy, while the remainder of the chapter is devoted to a detailed analysis of experimental results and theoretical interpretations of neutron scattering studies of neon, argon, krypton, and xenon.

The chapter on Brillouin spectroscopy is noted for its description of cryostat design and crystal growth.

The tremendous ingenuity displayed in preparing and characterizing suitable single crystals of these materials is only hinted at; but this is sufficient to earn the respect of all experimentalists. For example, in one study, single crystals of