

improvement on those published in 1931. They consist of two parts: the first (pp. 3) contains the 'key' to the second (pp. 21). The 'key' has been constructed with the help of divisions according to: (a) polishing hardness—galena and pyrrhotite are chosen as standard minerals, and three main groups are obtained; (b) anisotropy (isotropic, weakly anisotropic, strongly anisotropic); (c) colour (pure white, slightly coloured, distinctly coloured); (d) reflectivity as it appears in white light in air (7 subdivisions). In this scheme there are 189 categories into which the ore mineral names have been classified. In the second part the ore minerals are listed alphabetically and their main properties are tabulated in 15 columns. No information is given as to textures, intergrowths, exsolutions, paragenesis and literature; for further information the reader is referred to Ramdohr's work (to which these tables actually form a 'key').

Compared with the carefully written text, the tables give the impression of having been composed with less attention to detail. Leaving out of consideration the listed silicates, carbonates, sulphates and chlorides, the intergrowths and the discredited minerals, it appears that in the alphabetical tables 161 ore minerals are listed, whilst the 'key' gives only 136. This is highly unpractical for a useful 'key'. Another inconvenience is that many common ore minerals (e.g. gudmundite, tellurbismuth, sternbergite, stromeyerite, frieseite, coronadite, chalcophanite, hetaerolite, cosalite) are not found in these tables, whereas some very rare minerals (e.g. cooperite, beegerite, livingstonite, stibiopalladinite) have been inserted. Therefore, since the principles of the 'key' are, of course, sound and practical, the tables, in their present form, are not as appropriate for scientific work and not as useful for students as they could have been.

Finally, tables like these should be published separately, at least for the benefit of students, who, in the German literature, are now entirely dependent upon the extremely expensive combination of Ramdohr's and Schneiderhöhn's works.

Misprints are few, but slightly more frequent in the determinative tables than in the text. The paper is of good quality, the binding attractive and strong.

#### References

- BASTIN, E. S. (1950). *Mem. Geol. Soc. Amer.* No. 45.  
SCHWARTZ, G. M. (1951). *Econ. Geol.* **46**, 578.

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**Schwingende Kristalle.** By L. BERGMANN. Pp. 51, with 51 figs. Leipzig: Teubner. 1951. Price DM. 2-10.

This small booklet represents a summary of the well known book *Der Ultraschall* by L. Bergmann. It can be recommended for people who are new in the field of piezoelectricity and vibrating crystals. Though this booklet does not go into details, it gives a short summary of the main properties of vibrating crystals and describes the most important applications.

In the first chapter Bergmann describes the direct and indirect piezoelectric effect, including as examples quartz and rochelle salt. He then describes a few methods for investigating piezoelectricity in crystals. In the second chapter we find a short description of how piezoelectric crystal plates and rods vibrate. The third chapter gives a few examples of how these crystals are used in applications, such as the quartz clock, the piezoelectric oscillator, piezoelectric filters, piezoelectric loudspeakers and microphones. The fourth and fifth chapters deal with ultrasonics and, in particular, the use of vibrating crystals to generate ultrasonic waves for testing materials and for medical investigations. The book also includes a short description of the Schaefer-Bergmann method for the determination of the elastic constants in solids.

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**A Thousand and One Questions on Crystallographic Problems.** By P. TERPSTRA. Pp. 195, with many figures and tables. Groningen: Wolters. 1952. Price 24s.

This book contains 174 crystallographic problems, most of which include several supplementary questions. There is a general index, but no list of chapters. The English is good and clear, although a few awkward expressions are to be found. The chapters are as follows, the number of problems in each being given in parentheses: Millerian indices in the rhombohedral system (5); geometrical crystallography (33); rhombic section (4); transformations (7); twin crystals (11); gliding (17); lattices (19); drawing (7); optics (34); Laue patterns, space-groups and Weissenberg patterns (29); equivalent positions and structure factors (8).

In his preface the author says: 'The present volume is intended mainly for junior students in crystallography' and later he adds that he '... presents a selection to our *junior students*' (author's italics). This may be somewhat misleading because many of the problems and questions are quite difficult. Not only junior students, but senior students and their teachers would profit by working through several of these problems.

The value of solving problems in crystallography cannot be overstressed, and this book is a very useful teaching manual. Its publication draws attention to the present state of crystallographic teaching in which classical crystallography has had to be reduced, relatively, to its proper position in the now greatly enlarged field of the subject. Unfortunately, a division between the 'old' and the 'new' in crystallography still persists, although it ought to disappear with the development of a modern syllabus of crystallographic education. At present it is certain that a considerable proportion of the large number of students in X-ray crystallography have not received an adequate education in subjects such as projections, the geometry and symmetry of crystals, crystal twinning and calculations. This book will be useful in developing such teaching.

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