

Meetings

14–16 October 1970: Berlin, DDR. **Internationale Tagung 'Mikrosonde 70'**. For further information write to Arbeitsgruppe Mikrosonde der Physikalischen Gesellschaft in der DDR, Deutsche Vereinigung für Kristallographie (DVK), Berlin, DDR.

1–3 December 1970: Leipzig, DDR. **Theoretische und technische Aspekte der Entwicklungstendenzen der Kristallographie – Jahrestagung der DVK**. For further information write to Professor Dr H. Neels, 703 Leipzig, Scharnhorststrasse 20, DDR.

December 1970: Barcelona, Spain. Symposium on **Métodes de analisis estructural**. For further information write to Department of Crystallo-

graphy, University of Barcelona, Spain.

5–9 July 1971: Marseille, France. **Third International Conference on Crystal Growth**. Sponsored by the International Union of Crystallography and the International Union of Pure and Applied Chemistry. For further information write to Dr B. Mutaftschiev, Laboratoire de Mécanismes de la Croissance Cristalline, Faculté des Sciences de Marseille, Saint Jérôme 13, Marseille 13e, France. See also *J. Appl. Cryst.* (1 February 1970), 44.

25–31 July 1971: Boston, Massachusetts, U.S.A. **XXIII International Congress of Pure and Applied Chemistry**. Emphasis is placed on organic chem-

istry and macromolecules. For further information write to A. T. Winstead, Director, XXIII Congress of Pure and Applied Chemistry, c/o American Chemical Society, 1155 Sixteenth St. N.W., Washington, D.C. 20036, U.S.A.

25–30 June 1972: Madrid, Spain. **International Clay Conference**. See *Notes and News*, this issue page 285.

27 August–7 September 1972: Kyoto, Japan, **Ninth General Assembly and Congress of the International Union of Crystallography**. For further information write to Dr J. N. King, Executive Secretary, I.U. Cr., 13 White Friars, Chester CH1 1NZ, England. See also *Notes and News*, this issue, page 285.

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (M. M. Woolfson, Physics Department, University of York, Heslington, York YO1 5DD, England). As far as practicable books will be reviewed in a country different from that of publication.

Introduction to mineralogy. By CARL W. CORRENS. Pp. xi+484. New York: Springer-Verlag, 1969. Price: soft cover DM 49.60, \$12.40.

This is an English translation of the second edition of *Einführung in die Mineralogie*, that appeared a year earlier. Compared with the first edition many important revisions have been made.

Part I, *Crystallography*, has been revised by Professor Zemann to the state of being a fine compilation on classical and modern crystallography, including crystal mathematics, crystal chemistry, crystal physics, and crystal growth. Especially in the latter chapters the reader obtains a good introduction to the subjects with which a crystallographer and a mineralogist occupy themselves today. It is only a pity that the powder diffraction method, which is nowadays such an important tool for the student in mineralogy, is treated in only one page.

In part II, *Petrology*, some physical–chemical fundamentals are given, which could have been somewhat more extensive in view of the recent trends in mineralogy. The excellent chapters on weathering and on sedimentary rocks have benefited much from the author's great experience in this field. In the chapters on igneous and metamorphic rocks emphasis has been laid on the processes leading to these rocks. Although much geochemistry has been worked into the preceding chapters, a short summary of modern geochemistry is also given.

In part III, the Appendix, almost 120 pages of valuable tables are presented. Besides the crystallographic tables of crystal classes and space groups, the properties of the most

important 300 minerals are summarized by Professor Koritnig. In the petrologic tables modes and chemical analysis of the more important igneous, sedimentary and metamorphic rocks are listed. This well illustrated book ends with an extensive list of references for every chapter and an author plus subject index. This book can be recommended for those beginning a study of earth science as well as crystallography and to a lesser extent of chemistry.

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Mineralien. By H. SCHRÖCKE and K. L. WEINER. Band VII der *Sammlung Naturkundlicher Tafeln*, part II. Plates 91+9. Hamburg: Kronen-Verlag, 1969. Price: in Ganzleinen-Kassette DM 185, in Halbleder-Kassette DM 195.

This completes the mineralogical volume of this series, the first part of which was reviewed in this journal last year, with 91 further plates, 9 replacements of unsatisfactory plates issued in part I, and a volume (69 pp.) of text. The high technical standard of part I is maintained with few exceptions, notably plate 76, goethite, which is badly out of register. The volume of text provides a resumé that is brief indeed of morphology, crystal structures, mineral genesis

and classification; it includes an index of plates and acknowledgments to the owners of figured material. The significant contribution of this work lies in the execution of the splendid prints based on Claus Caspari's paintings of a quite remarkable selection of fine mineral specimens.

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Mineralogical applications of crystal field theory. By ROGER G. BURNS. Pp xii + 224. Cambridge University Press, 1970. Price £4, \$13.50.

In the last three or four years, mineralogical and geochemical journals have published increasing numbers of papers describing the application of some of the more modern spectroscopic techniques to the study of the role of transition-metal ions in minerals. At the forefront have been the meritorious contributions of Dr Burns. Dr Burns's book arose from series of lectures given at the Universities of Cambridge and Oxford, the lectures being based on material compiled by the author himself.

The early chapters are devoted to a non-mathematical outline of crystal-field theory and the theory of transition-metal spectra. Chapter 4 describes the measurement of absorption spectra and reviews of the origin of colour and pleochroism in minerals. Chapter 5 is devoted to a detailed description of the electronic spectra of suites of minerals, with emphasis on Fe²⁺-bearing silicates. Chapter 6 describes the crystal chemistry of transition-metal compounds and includes a very useful summary of the site occupancies of transition-metal ions in silicates. Modern techniques such as Mössbauer and infrared spectroscopies are also reviewed. The thermodynamic properties of minerals containing transition-metal ions are discussed in Chapter 7, while the distribution of transition metals in the crust is considered in Chapter 8. This last chapter also contains a good discussion of the Goldschmidt rules. Chapter 9 deals with the application of crystal-field theory to properties of the mantle. Chapter 10 features the use of molecular-orbital theory in the interpretation of the sulphide mineralogy of transition-metal ions, an area of research that is likely to prove more challenging than the silicates.

Although Dr Burns's book is directed primarily at geologists, mineralogists and chemists interested in the role of transition-metal ions in silicates and geologic processes, the book is nevertheless recommended reading for crystallographers, especially those with an interest in transition-metal compounds. Dr Burns points out that it is sometimes impossible, using conventional diffraction techniques, to distinguish between ions in different valencies, e. g. Fe²⁺ and Fe³⁺, and also ions of similar scattering factors, e. g. Mn and Fe. In these areas, the new spectroscopic techniques supplement the diffraction techniques.

References are complete to the end of 1968, and coverage of the important Russian literature is excellent. The numerous papers that have been published in the last year and a half testify to the increasing interest in spectroscopic studies of minerals. Indeed, mineralogy has gained a new dimension.

In summary, Dr Burns's book is a well-presented and a very useful review of the mineralogical chemistry of transition metals. His book is an important one in that it covers a field not previously described.

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Feldspars. Von T. F. W. BARTH. S. xi + 261. London: John Wiley, 1969. Preis 36s.

In seinem neuesten Buch bringt T. F. W. Barth eine Zusammenstellung der mineralogischen, physikalisch-chemischen und physikalischen Daten der Feldspäte; ausgelassen sind die optischen Daten, da 1967 im Birkhäuser-Verlag, Basel, ein ausgezeichnetes Werk von C. Burri, L. Parker und E. Wenk über *Die optische Orientierung der Plagioklase* erschienen ist.

Barth's Buch gliedert sich in sechs grosse Abschnitte: Mineralogie und Klassifikation der gesteinsbildenden Feldspäte – Überblick über die Pseudosymmetrien und Zwillingsbildung – Über die Kristallstruktur der Feldspäte – Physikalische Eigenschaften der Feldspäte – Thermodynamische Eigenschaften der Feldspäte – Historischer Überblick als abschliessendes Kapitel, in dem vor allen Dingen die unterschiedlichen Namen und ihre Entstehung erläutert werden.

Im Teil 1 werden die morphologischen Eigenschaften geschildert, die Subsolidus-Kurve Albit-Orthoklas erläutert und die Perthit-Bildung an Hand von Zeichnungen u. a. von Tschermak (1864) und Brögger (1890) diskutiert. Eine Reihe von eigenen Dünnschliffbildern norwegischer Gesteine ergänzen diese. Ausführlich wird auf den Zonarbau eingegangen und die Änderung der Gitterkonstanten der Plagioklase in Abhängigkeit von der Zusammensetzung wiedergegeben. Die in diesem Buch verwendete Nomenklatur ist in einem Diagramm des ternären Systems Orthoklas-Albit-Anorthit eingetragen.

Teil 2 zeigt die bekannten Verwilligungsgesetze. Die Eigenschaften des rhombischen Schnittes werden besonders im Hinblick auf die Temperaturabhängigkeit von Albit (Hoch- und Tiefalbit) diskutiert.

Einen grossen Umfang nimmt die Beschreibung der Kristallstrukturen der Feldspäte ein. Ausführlich werden die Gitterpositionen und ihr Einfluss auf die verschiedenen Typen von Reflexen diskutiert, besonders bezüglich des Ordnungs-Unordnungs-Problems der zu besetzenden tetraedrischen Punktlagen durch Silizium und Aluminium. Mögliche Umwandlungen und metastabile Zustände werden an Hand eines Diagrammes eingehend erläutert, die vorhandene Triklinität von Alkali-Feldspäten und deren Variationen in den verschiedenen Gesteinen dargestellt. In ähnlicher Ausführlichkeit wird auch das Verhalten der Plagioklase beschrieben, die in die Gebiete Peristerit, Schillerspat, Bytownit-Anorthit, intermediäre Feldspäte eingestellt werden.

Im Abschnitt physikalische Eigenschaften wird über die Härte, die Dichteunterschiede zwischen Kristall und Glas der gleichen Zusammensetzung, die Abhängigkeit des Volumens und der Dichte von der chemischen Zusammensetzung aufgezeigt, eingeschlossen werden hier auch die