berechnung und Kristallzeichnung eine übersichtliche, klare und, an der Enge des Raumes bemessen, völlig ausreichenden Behandlung. Der zweite Teil bringt eine geschichtliche Entwicklung der Kristallstrukturtheorie und die Unterlagen der Kristallstrukturbestimmung mit röntgenographischen Methoden (einschliesslich der Prinzipien der Fourieranalyse und Pattersonprojektion). Der dritte Teil ist der Kristallchemie gewidmet; er bringt alles Wichtige über die verschiedenen Bindungsarten im Gitter, über Raumbeanspruchung und Koordination, ferner eine knappe Beschreibung zahlreicher, gut ausgewählter Strukturtypen; der Erläuterung verschiedener Begriffe der Kristallchemie und den Reaktionen im kristallinen Zustand sind kurze, treffende Bemerkungen gewidmet. Auch in dem der Kristallphysik eingeräumten vierten Teil trennt der Verfasser scharf zwischen der Phänomenologie einerseits und der atomistisch-erklärenden Richtung. Von der Vektorenbehandlung ausgehend werden alle wichtigen kristallphysikalischen Eigenschaften in leichtverständlicher Darstellung beschrieben und behandelt; anschliessend erfolgt, so weit dies möglich ist, eine Deutung der Erscheinungen vom Gitterbau und aus der Gittertheorie heraus. Aufschlussreich ist auch ein kurzer Schlussabschnitt über Entstehung, Wachstum (und Zerstörung) der Kristalle.

Sicher werden Wünsche nach einer breiteren Behandlung dieses oder jenes Abschnittes oder nach Ergänzungen laut werden; der Gesamt eindruck, den man vom vorliegenden Buch gewinnt, ist aber der, das die gut durchdachte, in einem engen Rahmen gehaltene Darstellung alles wesentliche erfasst. Durch gut ausgewählte und reichliche Literaturhinweise wird eine nähere Orientierung in den einzelnen Gebieten leicht zugänglich gemacht. Die reichhaltige Bebilderung beruht überwiegend auf Neuzeichnungen; diese sind sehr einfach gehalten und so sehr übersichtlich und anschaulich. Eine Übersetzung des Buches in die deutsche Sprache wäre sehr wünschenswert, da der deutsche Büchermarkt eines vergleichbaren, knapp gehaltenen Werkes entbehrt; es ist nicht nur den Studierenden, sondern überhaupt den Vertretern der exakten Naturwissenschaften als orientierende und anregende Lektüre zu empfehlen.

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The Interpretation of X-ray Diffraction Photographs.

By N. F. M. HENRY, H. LIPSON and W. A. WOOSTER. Pp. ix+258, with numerous figs. and tables. London: Macmillan. 1951. Price 42s.

This book will be welcomed by many workers in the field of X-ray crystallography. It covers a field crossing many border lines and thereby fills a gap in the existing literature.

The various classical methods for obtaining X-ray photographs and their interpretation, short of actual structure determination, are extensively described, with many examples and problems from actual practice. This latter feature will make the book especially useful to those workers who want to learn about X-ray techniques without being primarily interested in structure work, for example, the ever increasing number of industrial scientists who wish to use this technique as an analytical tool or for texture investigations. Particularly in this connection it is a pity that no account of Geiger-counter methods has been given; in fact this instrument is not even mentioned. One could argue that the book deals with photographic methods, but the ionization chamber, which is certainly less used than the counter nowadays, is discussed. By including Geiger-counter methods, a description of Decker, Asp & Harker's elegant and quick method for pole-figure determination could have been given. Apparently the authors have only included those techniques with which they are thoroughly familiar, and there is certainly much to be said for this standpoint. The reader profits by it because he is given apt warning against the various pit-falls into which the inexperienced traveller may stumble. The effect of twinning on Weissenberg diagrams might have been mentioned; this is often the cause, not only of wrong space groups, but even of wrong cell-constant determinations.

Besides covering the subjects mentioned in the title, the book gives a clear presentation of basic crystallographic and diffraction theory in which I particularly enjoyed the use of adequate mathematics. The qualitative explanation given of deviations of Friedel's law is not quite correct, nor that of the phase shift of the reflected beam with respect to the primary beam.

The many figures are invariably very clear and well-drawn; this will be especially appreciated by teachers in crystallography who know by experience the difficulties involved in this work. Also, the many X-ray photographs are well chosen and reproduced. The printing is good; there are remarkably few misprints. It is a book which will seldom stand idly on the library shelf.

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Einführung in die Kristalloptik.

(Sammlung Göschen, Band 619.) By E. BUCHWALD. Pp. 138 with 121 figs. Berlin: de Gruyter. 4th ed. 1952. Price DM. 2·40.

Part I, following a few introductory pages on the crystal systems, gives an account of the phenomena of double refraction and polarization. The optical properties of calcite are introduced in terms of the ray-surface, but descriptions of the Fresnel-, wave-normal- and index-surfaces quickly follow. Biaxial crystals are described equally fully, with a short section on conical refraction, and this Part concludes with nine pages on the electromagnetic theory. Part II presents an orthodox account of interference phenomena in parallel and in convergent polarized light. Part III contains a brief account of optical activity and absorbtion, and the twenty pages of Part IV outline modern work on the theory of crystal lattices with the particular aim of showing how the phenomena of Part III can be explained. It will be seen that a very large amount of factual information is packed in small volume. The German style is easy, but the appeal of this booklet to English readers will probably be less to beginners seeking an introduction to the subject and

more to those, already possessing some knowledge of crystal optics, who wish to develop their acquaintance with scientific German.

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Moderne Allgemeine Mineralogie (Kristallographie). By W. NOWACKI. Pp. viii + 64. Brunswick: Vieweg. 1951. Price DM. 5·80.

In 64 pages the author gives a fluid and stimulating survey of the morphology, physics and chemistry of crystals. The booklet is intended for students and scientists who want to learn what lines of investigation form the subject of crystallography, what its modern methods are, and upon what other sciences crystallography closely impinges. Each of the three lines of research mentioned above is given an average of 20 pages. Text and diagrams —the latter well chosen from other sources—go some way in giving explanations, but, naturally, can mostly achieve no more than a suggestive description. Some conscientious readers will, of course, find this conducted tour unsatisfactory, but the larger class of readers to whom the book is addressed and who wish to gain only a general picture of crystallography, its methods and its results, will find this condensed and descriptive introduction well worth reading.

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Books Received

The undermentioned works have been received by the Editors. Mention here does not preclude review at a later date.

Gmelins Handbuch der anorganischen Chemie. Arsen. Pp. xv+475, with 20 figs. Weinheim/Bergstrasse: Verlag Chemie. 8th ed. 1952. Price DM. 140.

Gmelins Handbuch der anorganischen Chemie. Magnesium *A4*. Pp. 336, with 96 figs. Weinheim/Bergstrasse: Verlag Chemie. 8th ed. 1952. Price DM. 100.

Fouriersynthese von Kristallen und ihre Anwendung in der Chemie. By W. NOWACKI. Pp. 237, with 120 figs. and 28 tables. Basel: Birkhäuser. 1952. Price 34·30 Swiss francs.

Chemische Analyse der Gesteine und silikatischen Mineralien. By J. JAKOB. Pp. 180, with 10 figs. Basel: Birkhäuser. 1952. Price bound 18·70 Swiss francs.

Imperfections in Nearly Perfect Crystals. Edited by W. SHOCKLEY, J. H. HOLLOMON, R. MAURER and F. SEITZ. Pp. xii+490. New York: Wiley; London: Chapman and Hall. 1952. Price $7·50.

Moderne Allgemeine Mineralogie (Kristallographie). By W. NOWACKI. Pp. viii+64. Brunswick: Vieweg. 1951. Price DM. 5·80.

The System of Mineralogy. Volume II. By the late J. W. DANA and the late E. S. DANA, entirely rewritten and greatly enlarged by C. PALACHE, the late H. BERMAN and C. FRONDEL. Pp. x+1124, with many figs. New York: Wiley; London: Chapman and Hall. 7th ed. 1952. Price $15·00; 120*s*.

Dana's Manual of Mineralogy. Revised by S. HURLBUT, Jr. Pp. viii+530, with 471 figs. New York: Wiley; London: Chapman and Hall. 16th ed. 1952. Price $6·00; 48*s*.

Principles of Geochemistry. By B. MASON. Pp. ix+276, with 42 figs. New York: Wiley; London: Chapman and Hall. 1952. Price $5·00; 40*s*.

Grundriss der Kristallchemie. By J.-E. HILLER. Pp. vii+307, with 209 figs. and 72 tables. Berlin: de Gruyter. 1952. Price DM. 36.

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

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

Tabellen zur optischen Bestimmung der gesteinsbildenden Minerale. By W. E. TRÖGER. Pp. xi+147, with 256 figs. and 17 tables. Stuttgart: Schweizerbart'sche Verlagsbuchhandlung. 1952. Price DM. 27·80.

Erzmikroskopisches Praktikum. By H. SCHNEIDERHÖHN. Pp. xii+274, with 113 figs. and 39 tables. Stuttgart: Schweizerbart'sche Verlagsbuchhandlung. 1952. Price DM. 40·60.

X-ray Crystallographic Technology. By A. GUINIER, translated from the French by T. L. TIPPELL and edited by K. LONSDALE. Pp. xiii+330, with 18 plates and many diagrams. London: Hilger and Watts. 1952. Price 56*s*.