qui sont examinées à la fois du point de vue expérimental et théorique: ce chapitre donne au lecteur une idée très claire des possibilités actuelles des rayons X dans ce domaine. Un autre chapitre nouveau est consacré à la diffraction par les corps amorphes et l'interprétation des diagrammes par l'analyse de Fourier suivant les méthodes de Zernicke & Prins. L'intérêt de ces chapitres vient de ce que l'auteur a travaillé personnellement ces questions et que le lecteur y trouvera des renseignements de première main.

Signalons en outre que le lecteur trouvera au cours de l'ouvrage la description du bétatron, un aperçu sur les méthodes microradiographiques et sur l'utilisation des compteurs Geiger–Müller tant en radiographie qu'en cristallographie. Enfin les photographies d'appareils ont été remplacées par celles de récents modèles (de construction allemande).

Mais peut-on dire que le traité dans son ensemble a été 'auf den neuesten Stand gebracht'? Par exemple nous pensons qu'il est dommage de voir dans un livre publié en 1949, les unités Ångström et kX. encore confondues, alors que les prochaines *Tables Internationales* feront usage des nouvelles valeurs des longueurs d'onde (1,540 A. au lieu de 1,537 kX. pour Cu $K\alpha$). Le tableau de Mendeleïeff (p. 44) paraîtra démodé aux jeunes étudiants. Ce qui est plus important, c'est qu'en de nombreux endroits on aurait aimé voir citées des techniques récentes qui sont maintenant d'un usage courant. Notons par exemple qu'il n'est pas fait mention des tubes à fenêtre de beryllium des tubes à haute tension (de 1 à 5 000 000 volts) de l'index d'Hanawalt pour l'identification des diagrammes, des possibilités introduites dans l'analyse spectrale par les cristaux courbés, des progrès qu'a permis pour les diagrammes de poudre l'usage de chambres de grand diamètre ou de monochromateurs, progrès qui répondent partiellement aux souhaits formulés par l'auteur (p. 224), etc. Mais ces remarques prouvent seulement que la mise à jour d'un ouvrage par son propre auteur est une tâche probablement très difficile. Cela ne veut pas dire que tel qu'il est, nombre d'entre nous ne soient contents de pouvoir à nouveau consulter le livre de Glocker, qu'il était impossible, avant cette nouvelle édition, de se procurer.

Je voudrais faire enfin une dernière remarque: dans un traité de ce genre, il ne peut être question de faire une bibliographie complète de sujets traités. L'auteur ne peut que choisir un petit nombre de travaux qui illustrent son exposé. Mais on est frappé au cours de la lecture de trouver parmi les références une très forte majorité de travaux allemands, alors que souvent il n'est pas tenu compte de résultats importants obtenus dans d'autres pays. C'est là sans doute la conséquence des difficultés de documentation que l'auteur a rencontrées au cours de ces dernières années. Mais on aurait souhaité que celui-ci profite de l'actuelle perméabilité des frontières aux idées et aux livres, pour éviter que ses jeunes lecteurs gardent une vue partielle—sinon partiale—des progrès de nos connaissances dans le domaine des rayons X.

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## Mineralogische Tabellen.
By H. STRUNZ. Pp. xiv+308, with 73 figs. Leipzig: Akademische Verlagsgesellschaft Geest und Portig K.-G. 2nd ed., 1949. Price DM. 21·00.

This is the second edition of the well-known tables of H. Strunz which were first published in 1941. The intended scope of the work is a tabulation of all minerals, both valid and discredited, and to give an outline of crystal chemistry. How this is done is most easily demonstrated by the following headings, taken from the book:

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| Einleitung | 6 pages |
| Einführung in die Kristallchemie | |
| Allgemeine Definition und Gesetze | 24 pages |
| Spezielle Kristallstrukturen | 40 pages |
| Systematik der Mineralien auf kristallchemischer Grundlage | 171 pages |
| Ausgeschiedene Mineralnamen und Register | 70 pages |
| Neuere Literatur zur Kristall- und Mineralkunde | 2 pages |

The introductory chapters on crystal chemistry have been enlarged and partly rewritten, and they are on the whole, in comparison with the first edition, more readable and useful. For instance, a small practical detail may be stated—in the earlier edition the atomic and ionic radii could only be read from a schematic graph, but in this edition they have been tabulated. The short descriptions of typical and important crystal structures have only been slightly modified.

The main interest of the would-be user of this book can be considered to lie in the correctness and completeness of the information given in the systematic tabulation of minerals. For every mineral the chemical formula, the crystal class, the space group, the unit-cell dimensions, the number of formula units in the cell, and the morphological elements are given, if known. The name of the investigator and year of publication are also given in a great number of cases where X-ray data are known. I think this is a very good idea, and it is only to be hoped that Strunz, in a new edition, will complete this type of information, which is of great value to his readers. The original principles of classification used by Strunz have remained unchanged and have already been discussed in various reviews of the first edition.

It is evident that it is impossible completely to avoid misprints and mistakes in a work of this kind. The first edition was very useful in spite of the fact that it contained a number of errors, most of which were without doubt the result of difficulties arising from the war. In order to ascertain the reliability of the second edition I have worked with it for some months and have checked all data which I have used. The difficulties mentioned above have in no way lessened, and so it is remarkable that Strunz has been able to correct and complete this new edition to such an extent.

Through the helpful co-operation of many colleagues a large number of papers published during and after the war were made accessible to Strunz, but nevertheless a number of omissions occur—due no doubt to the present difficult situation. An example may serve to illustrate this. Even the most recent papers of Peacock's Toronto school have been taken into account by Strunz, but it is evident that he has not seen Peacock's paper of 1940 on augelite. Inasmuch as these omissions and other mistakes are few and far between, they have no real influence on the value of the tables, and everyone working, not only with minerals but also with inorganic compounds, will find it of great use to have this new edition of Strunz's book on his bookshelf.

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### On the Systems formed by Points Regularly Distributed on a Plane or in Space. By M. A. Bravais, translated by Amos J. Shaler from *Journal de l'École Polytechnique* (1850), **19**, 1, being Memoir No. 1 of the Crystallographic Society of America. Obtainable through the Secretary-Treasurer, Dr W. Parrish, Philips Laboratories, Inc., Irvington-on-Hudson, New York, U.S.A. Pp. viii+113, with 41 figs. 1949. Price $3·90.

This first 'memoir' of the Crystallographic Society of America is a very suitable and dignified memorial not only to the great mason who laid the foundations of structural crystallography, but also to the editing Society which has meanwhile merged its activities with those of the former ASXRED by forming the American Crystallographic Association. The translation of Bravais's paper is well done and enables the reader to follow in English the clear and meticulous arguments, which are given *more geometrico* in all detail. Those who have been introduced to lattices and space groups by modern direct vectorial and group-theoretical methods will be interested to see how all the basic facts were found and critically discussed before the formalisms for condensing the proofs had been developed.

In the last chapter, on Polar Lattices, most of the properties of the reciprocal lattice are to be found, except the one which really means reciprocity, namely, that the scalar product of vectors taken from the two lattices be dimensionless. This idea is contained in Gibbs's introduction of reciprocal vector sets; it is an important property because it is closely tied up with the ideas of co- and contra-variance of Fourier transformation, and of the duality between co-ordinate and momentum space. In defining the vector in the polar lattice as dimensionally equal to that of the crystal lattice, Bravais missed a point. No wonder though, because at the time he wrote he must have disliked the idea—if it occurred to him—that a length in the polar lattice should really represent a reciprocal length in space.

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### An Introduction to Luminescence of Solids. By H. W. Leverenz. Pp. xv+569, with 143 figs., 23 tables and 1 chart. New York: Wiley; London: Chapman and Hall. 1950. Price $12; 96*s*.

The great importance that luminescent systems have gained in engineering during the last decades has caused a considerable extension of research in this field. Dr Leverenz has taken a very active part in these investigations, and in this book he gives us his views about both the chemistry and the physics of luminophors. Various new results obtained by the author and his collaborators are mentioned, but results of other investigators are also extensively discussed. Readers of this journal will particularly appreciate that much attention is paid to the chemical build-up of luminescent systems, and the close relations which exist between the optical properties and the crystal structures. As luminescence usually originates in centres with limited extension, the information obtained from it mainly concerns these centres. Only in a few cases, however, is this information sufficiently precise to enable us to draw definite conclusions regarding the atomic configurations; in most cases such conclusions must be based on a complex of by-phenomena.

In this connexion it may be questioned whether the evidence in favour of the view that in the sulphides and selenides the centres consist of activator atoms at interstitial sites is sufficiently strong to accept it as a basis of a classification, as the author does. The acceptance of this view leads to a number of statements regarding '*i*-centre phosphors' which actually hold only for sulphide phosphors—independent of whether their centres are of the interstitial or of the substitutional type.

A generalization of a similar kind concerns substitutional centres. As it is probable that manganese is often present at normal lattice sites, while on the other hand the luminescence of manganese takes place between levels of the manganese ion ('originative activator') it is stated that substitutional activators are usually of the originative type, a statement which is certainly not generally true (SrS–Eu!). This is regrettable, since these rules were obviously intended to bring order to the immense amount of experimental material. In a book like this, in which the author does not hesitate to speak freely, our opinion is bound to differ from his concerning a number of points. This, however, does not diminish the merits of the book. It gives a broad survey of the field of solid luminescent materials, it contains some very instructive figures, a number of extensive tables, and finally an impressive list of references. It will therefore certainly be of great value both to workers in the field and to all interested in the application of phosphors.

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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.*

**Der Ultraschall und seine Anwendung in Wissenschaft und Technik.** By I. Bergmann. Pp. xi+748, with 460 figs. and 83 tables. Zürich: S. Hirzel Verlag. 1949. Price 50 Swiss francs.

**X-ray Studies on Polymorphism.** By T. Ito. Pp. 236, with 100 figs. Tokyo: Maruzen Co. Ltd. 1950. Price $10·00.