

BOOK REVIEWS

X-RAY POWDER DATA FOR ORE MINERALS: THE PEACOCK ATLAS, BY L. G. BERRY AND R. M. THOMPSON, *Geological Society of America Memoir* 85, 1962. 281 pages plus 27 plates. \$8.25.

The long-awaited "Peacock Atlas" is finally in print. It represents the results of many years' work by the late Professor M. A. Peacock and his graduate students at the University of Toronto, on the x -ray diffraction studies of ore minerals. The data have been compiled and edited by Professors L. G. Berry of Queen's University and R. M. Thompson of the University of British Columbia.

The book is a first-rate compendium of x -ray powder diffraction data based on original work, and is not merely a compilation from the literature. Anyone acquainted with the painstaking care that characterizes all the work undertaken by Professor Peacock can be assured of a high degree of reliability of the data. Furthermore, the careful editing that the work has undergone in the hands of Berry and Thompson provides further assurance that errors have been kept to a minimum.

The main portion of the Atlas is devoted to tables of x -ray data for each of the minerals investigated, including intensities, observed glancing angles, measured and calculated interplanar spacings, and indices of the reflecting planes. In addition, each of the tables is accompanied by a short discussion that includes crystallographic information, a list of similar patterns, references to previous investigators and, in many cases, structure data. Such relatively complete characterization of every pattern is most unusual in a compilation of this size, making the work a contribution of first magnitude. Although the data were compiled by Professor Peacock between 1938 and 1950, the authors have included later references wherever these have a direct bearing on the powder pattern, crystallography, or structure of the mineral in question.

Other portions of the Atlas include alphabetical and chemical indices of the mineral species covered, an index of the strongest powder lines, a locality index, and reproductions of all the powder films.

The minerals are arranged more or less in accordance with Dana's classification, and are divided into 8 groups. The number of minerals in each group is as follows:

Native elements	28	Halides	5
Sulfides	126	Carbonates	3
Sulfosalts	58	Tungstates and molybdates	8
Oxides	66	Quartz	1
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			295

The coverage of the native elements, sulfides and sulfosalts is very good. Coverage of the other groups, as might be expected from the above compilation, is less complete. In deciding what minerals to investigate, the authors were evidently confronted by the problem of what constitutes an ore mineral. Their solution has apparently been to include all the available opaque minerals and to throw in a few of the more common gangue minerals. The reviewer sees no particular advantage in including data for the few halides, carbonates and quartz, as these data are readily available from a variety of sources. If they are to be included, however, it seems unnecessary to list them in individual groups, and a general group with a heading, such as "Common Gangue Minerals" should have sufficed. This would also have eliminated the incongruity of quartz being in a group by itself.

This evidently arbitrary selection of minerals for inclusion in the Atlas leads to a rather serious deficiency. Practically none of the secondary ore minerals have been included. One would expect that, in a volume entitled *X-ray Powder Data for Ore Minerals*, secondary ore minerals such as malachite, anglesite and smithsonite would have taken precedence over such non-ore minerals as quartz and calcite. Furthermore, only a very few of the radioactive minerals have been included. The title of the volume is consequently somewhat misleading, implying, as it does, a comprehensive coverage of all ore minerals.

Inclusion of reproductions of the powder patterns is probably a good idea, but it is unfortunate that the reproductions are of a rather poor quality, due in all probability, to the quality of the paper used. If inclusion of the powder patterns is justified, surely the use of a superior grade of glossy paper would be more than justified.

A few minor inconsistencies appear in the rendering of mineral names of foreign origin, especially with respect to the use of the German "umlaut"; why, for example, are they retained in fülöppite and replaced by an "e" in loellingite (löllingite)?

In summary, the Atlas appears to be a highly reliable source of x-ray powder diffraction data for many of the ore minerals, and includes a substantial amount of information that has not previously been published. Although it is not sufficiently broad in scope to serve as a sole source of mineral diffraction data, even in ore mineralogy laboratories, it is nevertheless a most valuable addition to current literature on the subject.

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FELDSPAR SYMPOSIUM, INTERNATIONAL MINERALOGICAL ASSOCIATION, COPENHAGEN (August 1960), F. LAVES AND J. M. FÚSTER, EDITORS. *Instituto "Lucas Mallada," Libreria Científica Medinaceli, Duque de Medinaceli, 4, Madrid; Fascículo VIII of the Cursillos y Conferencias series*, 182 pages, Sept. 1961. Price 80 pts. (\$1.50 Canadian).

This paper-bound volume brings together all of the papers presented at the Feldspar Symposium of the International Mineralogical Association held in Copenhagen at the time of the International Geological Congress there in August, 1960. It is a valuable service to mineralogists and petrologists throughout the world, because the papers do not appear in the Congress volumes.

The volume includes a preface in Spanish and in English by the editors; fourteen papers in English; three papers in French; one paper in German; five papers in English abstract only; a "Bibliography of papers dealing with structure analyses of feldspars"; and the Proceedings of the International Mineralogical Association, second general business meeting of delegates, Copenhagen, August 22nd and 24th, 1960. The reviewer will not attempt to criticize each of the papers, partly because it is much more ably done in verbal and prepared discussions following most of the papers. Some high-lights will serve to illustrate the nature of the volume.

The subject matter is divided into three parts. Under "Miscellaneous Aspects of Feldspars" three papers discuss the use of coexisting plagioclase and alkali feldspar as a geological thermometer, the limitations of which are commended to the attention of all petrologists. Two papers describe the elegant French studies of exchange of ions between feldspars and hydrothermal solutions and between feldspars and molten salts, emphasizing the role of H^+ and OH^- ions (supplied by water) in breaking Si—O and Al—O bonds.

Under "Alkali Feldspars," a new determination of the structure of orthoclase is briefly summarized. In five papers and an abstract the evidence bearing on the stability relations of the structural modifications of the alkali feldspars is reviewed and some new data are presented; with their accompanying discussions, the papers serve very well to caution against uninformed use of feldspars in petrogenetic interpretations. Three papers describe studies of alkali feldspars in igneous and metamorphic rocks; an interesting suggestion that orthoclase is diagnostic of the granulite facies of metamorphism and microcline of the amphibolite facies deserves further study.

Most of the section on "Anorthite and Plagioclases" is devoted to the structure of the intermediate plagioclase feldspars and to a discussion of the structural modifications of anorthite. New detailed structural

analyses promise to provide better understanding of the structural modifications of plagioclase feldspars, if not of their quantitative phase relations.

This report of the Feldspar Symposium at Copenhagen is recommended to mineralogists and petrologists as a review of the current state of knowledge of the feldspars, and as a selected bibliography of more complete accounts of the studies. The Instituto "Lucas Mallada" deserves thanks for making the papers available under one cover.

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PROCEEDINGS OF THE SEVENTH ANNUAL MEETING OF THE MINERALOGICAL ASSOCIATION OF CANADA

The seventh annual meeting of the Mineralogical Association of Canada was held on April 24-25, 1962 at the Chateau Laurier Hotel, Ottawa, Ontario, in conjunction with the annual meetings of the Canadian Institute of Mining and Metallurgy and the Geological Association of Canada.

The general business meeting of the Association was held on April 25 and was chaired by the President, R. M. Thompson; L. G. Berry, Editor, reported that the special issue on Sudbury ores (Volume 7, part 1) would be ready for distribution in May, that the regular issue for 1962 had gone to press, and that a special issue for 1962 was being prepared. Separate copies of the Sudbury issue bound in hard covers would be available for sale to non-members and as extra copies. The publication of two regular issues of *The Canadian Mineralogist* annually was under consideration.

H. R. Steacy, Treasurer, pointed out that the Association's fiscal year now corresponds to the calendar year and that the balance on hand, on December 31, 1961, was \$1865.99.

S. Kaiman, Secretary, reported that 235 ballots were cast in the election of officers. The officers elected to serve in 1962 are:

<i>President</i>	R. M. Thompson	
<i>Vice President</i>	D. H. Gorman	
<i>Secretary</i>	S. Kaiman	
<i>Treasurer</i>	H. R. Steacy	
<i>Committee Members</i>	E. H. G. Cornford	E. H. Nickel
	J. P. Girault	J. A. Gower
	S. A. Forman	G. Perrault

Reports were also heard from E. H. Nickel, chairman of both the Programme Committee and the Membership Committee. The Association now has more than 600 members drawn from over 30 countries.

The annual banquet of the Association on April 25 took the form of a luncheon