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BOOK REVIEW

Hydrous Phyllosilicates (other than Micas), Reviews in Mineralogy, Volume 19, edited by S. W. Bailey, Mineralogical Society of America, Washington, D.C., 1988. 725 pages, softbound, $18.00. ISBN 0-939950-23-5.

Hydrous Phyllosilicates (other than Micas), volume 19 of the Mineralogical Society of America's **Reviews in Mineralogy** series, is appropriately dedicated to S. W. "Bull" Bailey who organized the MSA short course by the same title, edited the book, and authored three of its seventeen chapters. The dedication was arranged by Bull's colleagues and friends without his knowledge and reflects his many contributions to his science and to his students and colleagues—I can personally testify to the accuracy and completeness of his responses to requests for information. It seems particularly fitting that a volume of this quality marks Professor Bailey's retirement from the University of Wisconsin after 38 years of service.

Regardless of what your professional focus is—industrial or academic, applied research or basic research—this volume is a must for anyone interested in phyllosilicates. The volume ranges in scope from H. H. Murray's "Kaolin Minerals: Their Genesis and Occurrences" to "Crystal Chemistry, Classification, and Identification of Modulated Layer Silicates" by S. Guggenheim and R. A. Eggleton. The other fifteen chapters include an "Introduction" to the book, "Polytypism of 1:1 Layer Silicates," "Kaolin Minerals: Structures and Stabilities," "Serpentine Minerals: Structures and Petrology," "Structures and Compositions of Other Trioctahedral 1:1 Phyllosilicates," "Isotopic Studies of Phyllosilicates," "Talc, Pyrophyllite, and Related Minerals," "Stability, Phase Relations, and Thermodynamic Properties of Chlorite and Serpentine Group Minerals," "Chlorites: Structures and Crystal Chemistry," "Chlorites: Metamorphic Petrology," "Vermiculite," "Smectites," "Vector Representation of Phyllosilicate Compositions," "Mixed Layer Chlorite Minerals," and "Sepiolite and Palygorskite." These individual reviews serve as an introduction and as a reference to specialists in the field. Enough information is presented to give a solid background in any of these areas that a reader might choose to pursue.

It is hard to see how any one reviewer could do justice to a volume of this scope and complexity. My approach was therefore to read each section from the viewpoint of seeking a summary of that field of knowledge and to see whether or not the coverage included detailed up-to-date information for a specialist. Both requirements were well satisfied throughout the book.

This volume is well organized, and the chapters follow one another logically. I especially enjoyed the manner in which clay minerals and their metamorphic equivalents were treated as a continuum. Although little was said about kaolinite/smectite mixed-layered minerals, the general lack of knowledge of these materials makes this small omission somewhat understandable and may stimulate new research on this group of soil clay minerals. Everything else that I could think of related to the subject matter *is* in this volume.

Most chapters cover theoretical background and up-to-date information on the properties of the mineral group or the topic of discussion. The tendency of authors to discuss important points in some detail is a big help to an interested reader. For example, I found the discussion of ordering between layers in vermiculite to be of special value in the debate over the distinction among smectite, vermiculite, chlorite, and illite. Clearly, the boundaries between smectite and vermiculite continue to be blurred by the variable effects of layer charge, exchangeable cation, 2:1-layer chemical content, and type of treatment.

The book contains new data and new syntheses of existing information. For example, the chapter on smectites includes new, high-quality transmission electron micrographs that provide an excellent summary of the crystallite morphology of the group. Almost every chapter includes tables and figures, such as those that pertain to mixed-layered chlorites, which provide new insights from existing information. The emphasis given to chlorite reflects its growing importance as a subject of study and the recognition of its formation in a range of geological environments. Several authors included a discussion of the geologic occurrences of the mineral under discussion. The best example of this helpful information is the chapter on the occurrences of kaolin minerals. The chapter on sepiolite and palygorskite even contains useful information on industrial properties. The chapter on the vector representation of the composition of these minerals concludes by pointing out that the method works and that much may be gained by this new approach. Examples such as these show the breadth of information included on this wide range of subjects.

The print quality is excellent, and the text has surprisingly few typographic errors. The references are as up to date as possible. To repeat, if you are in commerce or research and the phyllosilicates other than micas are part of your concerns, this book belongs on your shelf.

RANDALL E. HUGHES