

Review of *Sedimentation and Sediment Transport* by Albert Gyr and Wolfgang Kinzelbach

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The title of this book caught my attention first. With double emphasis on sediment in the title, I really expected to read about recent developments in sedimentation. The book is actually the outcome of the Symposium on Sedimentation and Sediment Transport held September 2–6, 2002, at the Monte Verita, near Locarno, Switzerland. The symposium was jointly organized by the Institute of Hydromechanics and Water Resources Management and the Institute of Fluid Dynamics. The event was held under the auspices of the Swiss Federal Institute of Technology Zurich (ETHZ). At the symposium, an attempt was made to present new results in mathematics and natural sciences relevant to the sediment problem. The book's authors suggest that theoretical research and laboratory experiments are incomplete without the feedback from field observations and measurements.

This book can be viewed as the revised proceedings of the symposium. It includes 42 relatively brief articles. The content is subdivided into eight sections, namely, I—Turbulence, Mainly Its Local Aspects; II—Turbulence and Sediment Transport, Turbulence and Sedimentation; III—Turbulent Structures and Sediment Transport; IV—Two-Phase Flows; V—Self-Organization and Sedimentation Processes; VI—Self-Organization in Sediment Transport; VII—Problems Related to Field Measurements and Input Needed for Numerical Models; and VIII—Measuring Techniques.

The book reminds me of the beautiful location of the Monte Verita overlooking Ascona and the gorgeous Lago Maggiore. I had the pleasure of attending the Grain Sorting Seminar at the Centro Stefano Franscini in 1992, and this book brings back all the great memories of the magnificent location and lively discussions. These seminars are usually most amenable to in-depth discussion on technical issues with scientists around the world.

Back to the book itself: The authors have attempted to tackle some of the most difficult problems in sedimentation—i.e., the effects of turbulence on sedimentation processes. Despite many breakthroughs, turbulence remains extremely complex and elusive even to the brightest minds, let alone sedimentation, which remains very complex in spite of the major contributions of the

past century. The authors gathered experts to tackle some of the most difficult problems of the interaction between turbulent flows and sediment particles, particularly near the boundaries, such as river beds and river banks. Some of the problems (burst and sweep cycles, bed forms, river braiding, self-organization, and grain sorting) are extremely interesting. But even if the difficult problems are at least tackled, most questions remain unanswered, and it is difficult to grasp the main contribution of this set of papers. Many articles are presented as extended abstracts, without conclusions. cursory reviews and introductions to complex topics are displayed without a direct integration of the components. Perhaps a brief digest of all this information for each topic would have been extremely useful to the reader. Without it, the readership is limited to a few experts on the topic and perhaps some research associates and post-docs working on one of these complex topics. What the book offers is a brief overview of the complexities of turbulence and sedimentation. References will be useful to researchers and scientists; however, the content is of limited access to practitioners, sedimentation engineers, and undergraduate students. About half of the papers deal with turbulence, so the title may be somewhat misleading in this regard—it seems that the word turbulence should be in it. The double reference to sediment in the title also appears redundant.

The editors attempted to put things together rather quickly. The presentation of the papers is highly variable in approach, format, and typeset. The publisher provided a high-quality binding, though the typesetting, font type, and type size are highly variable and resemble camera-ready printing.

The strength of the book lies in the presentation of state-of-the-art information on turbulence and sedimentation. The problems of bedforms, braiding, self-organization, and sorting will challenge many of us for years to come. This book is an excellent starting point on where we stand right now.

The weakness of the book lies in its readership being limited to experts working in the field of turbulent interactions with sediment particles. The book is not readily accessible to practitioners and most graduate students. The price is also quite high and the title lacks the word “turbulence,” which otherwise transits the entire symposium. The challenges in this field are very high, and the merit of this effort was probably more in participating in the symposium discussions than in reading the proceedings.

In summary, the book is recommended to researchers interested in tackling the complexities of sediment transport in turbulent flows. It is, overall, a nice summary of the current state of knowledge in this field. I can hardly see how it could be used in the classroom or in engineering practice; sedimentation engineers should keep an eye on the future developments in this area, but the book contains few answers for immediate practical use.