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Physics of Sedimentology, 2nd ed., by Kenneth J. Hsü, 2004. Springer-Verlag, Tiergartenstrasse 17, 69121 Heidelberg, Germany; xiv + 240 pages, hardbound; US\$ 79.95. ISBN 3-540-20620-5.

This second edition of Hsü's famous book has long been waited for. The first edition has become a classic, which is even searched for (and sold) through internet. One can only wonder why it has taken so long to publish this second edition. The fifteen years that have passed since the first edition (1989) have witnessed significant progress in sedimentology, and it was to therefore to be expected that this new edition would differ strongly from the first one. It does not, however. Hsü states in his preface: "Reading the text of the first edition again, I found little need for revision. The Newtonian Laws of Motion are as good today as they were 15 years ago, nor have the fundamental physical principles of sedimentology changed." This may be true, but more attention could - and should in my opinion - have been paid to the application of the theory of physics to present-day 'hot topics' in sedimentology.

Two chapters have been more or less revised (those on mass transport and on suspensions), and some changes were made in one of the chapters that I think of great importance: Why Creativity in Geology. This last chapter should be read by all earth scientists, in whatever specialism they are working. With respect to the revisions made in the second edition, it is interesting to note that Hsü states that he proposed to the publisher to change the subtitle from the first edition (A Readable Textbook for Beginners and Experts) into 'A Readable Textbook of Physics for Geology Students'. Apparently Hsü judges that present-day students now have the same fundamental knowledge—and need the same new information—as experts 15 years ago. Unfortunately, he does not detail why he wanted this change. Even more remarkable is that the publisher did not follow Hsü's proposal, because the subtitle of the second edition now is: Textbook and Reference. An enigma.

Less enigmatic is the approach followed by Hsü with respect to his didactics. He makes clear that physical processes and geological phenomena are closely interrelated. This is wonderfully expressed in the titles of his chapters, after an introductory chapter and a chapter on Sorting Out and Mixing. The following chapters are (3) Grains Settle, (4) Sediments are Moved, (5) Rocks Fall, (6) Suspensions Flow, (7) Sand Waves Migrate, (8) Oceans are Ventilated, (9) Groundwater Circulates, (10) Components Equilibrate, (11) Evaporation Pumps, (12) Isotopes Fractionate, and (13) Basins Subside. Some of these chapters are almost purely physics, others are less. In my opinion, there is no good reason for these differences. Perhaps the somewhat different contents of the various chapters result from the fact that they reflect lectures. On the other hand, all chapters end with a section on 'Suggested Reading', which is most helpful. Considering the fact that Hsü has worked for a long time in Switzerland, it is not amazing that many

of his case stories are devoted to the Swiss Alps. But he might have raised even more interest by paying somewhat more attention to case histories in other parts of the world (where he has a lot of experience as well).

One must nevertheless conclude that the 11 chapters dealing with physical processes are of high quality from a didactic point of view. It is therefore fairly unfortunate that this edition (still) contains some shortcomings. These deal, for instance, with terminology. An example is the use of the term 'Hjulström curve' where the commonly used (and more correct) term is 'Hjulström diagram'. The terminology of mass-transport mechanisms and deposits in Chapter 5 differs also from common use and is in some cases even confusing. Sometimes definitions used by Hsü are just incorrect, for instance where he states (p.15) that heavy minerals are minerals denser than quartz (on the other hand: his remark that the term 'heavy minerals' is incorrect and should be replaced by 'dense minerals' is very justified).

The figures in the book are, as a rule, clear and didactically of high quality. This makes it even less understandable why some sloppy mistakes are present. In figure 2.5, for instance, the units of the grain sizes (in mm and in phi) are lacking. Figure 3.5 is wider than high, and has been printed over a full page (not necessary: it could have easily be done on page-width format) in such a way that part of the text is unreadable (top-down). Some more of similar mistakes could have easily been avoided by careful reading of the proofs. This also holds for some 'typing errors'.

More confusing is that statements at different places in the book can be inconsistent. An example is to be found in the interesting chapter 14 (Why Creativity in Geology?), where Hsü states on page 201: "Geology became science when Hutton wrote a theory of Earth on the basis of rationalizing, without preconceived notions, his observations. Ever since, induction from observational facts has taken precedence in geology, and deduction is considered a synonym of speculation". These last few words made me wonder how Hsü could have made such a mistake. Then I read on p. 204, where an engineering-geological study did not deal with all relevant topics, thus ending in the Vaiont catastrophe: "It does not seem scientific to make wild speculations. They do not understand that deduction is not speculative: deduction is good science."

In spite of these shortcomings, the book is very useful. I do not entirely agree with Hsü that you cannot understand sedimentology well without understanding the underlying physics (I can listen to a radio, and I can drive a car without knowing precisely how the techniques work), but for many sedimentologists the book will be very useful, indeed. The two appendices (I: symbols and their dimensions; II: Quantitative relations in the physical principles of sedimentology), the 5-page reference list and, particularly, the 18-page index are very helpful. For students the book will certainly be useful, and I see no good reason why experts are no longer included in Hsü's target group.

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