843. **Perrin, M. & Rainaud, J.-F.** (2013): Shared Earth modeling. Knowledge driven solutions for building and managing subsurface 3D geological models (with contrib. by M. Abel, Y.A. Ameur, A. Bac, M. Baron, N. Belaid, C. Benuis, H. Beucher, M. Bourges, O. Corby, M. Daniel, P. Durville, M. Elkouhen, A. Giboin, P. Giroux, K. Goldberg, S. Grataloup, F. Husson, S. Jean, L.S. Mastella, O. Morel, M. Poudret, D. Renard, L.F. de Ros, S. Schneider, M. Thonnat, T.N. Van, P. Verney & B. Zhu-Colas). – In: IFP Energie Nouvelles Publications. – XXIV + 400 pp., 270 figs. (184 in col.), 9 tables, 6 boxes; Paris (Éditions Technip), 17 x 24 cm, paperback, ISBN 978-2-7108-1002-5; € 75,–.

The present book about high-tech geological models (Do not be in hurry to put it aside!) is not a kind of boring reading for only devoted persons, but something more, which should attract attention of a broad circle of specialists. Speaking briefly, this is yet another wonderful volume from Éditions Technip – it appears this publisher always knows how to satisfy modern geologists. The reviewed book is an outstanding synthesis of knowledge about geological modeling. It deals with shared models, which provide specialists unlimited access to data and assumptions.

The book consists of 5 parts, 15 chapters, and various arrangements. The first part explains the Earth models and their utility in the modern geology. It begins with consideration of physical and descriptive, analogical and numerical, static and kinematic models. A clear distinction between models and representations is made. The latter are models expressed through the modeller-chosen language. Three "philosophies" of modeling are rationalist, stochastic, and artificial intelligence-based. Then, the application of models to petroleum geology is discussed. The reviewer's heart was conquered by chapter 3, where the authors review the past and present software for geological modeling. The second part deals with knowledge-oriented solutions. Issues like syntactic rules attached to geological objects and meshing strategies are discussed there. The third part is addressed to knowledge formalization and ontologies. There, much is told about time scales. Fig. 10.13 (p. 226) and Fig. 10.14 (p. 227) demonstrate how geologic time and geologic dating can be formalized to be used for the purposes of modeling. This is not so easy task, and its accomplishment requires correct understanding of the classical laws of stratigraphy and the modern paradigm of geochronology.

The fourth part is about knowledge management. This is a set of approachs, which permit to link the established ontologies and the "really working" models. Of course, web engines serve well for such a purpose. And the authors are right, when they judge geological modeling as data-intensive engineering system. The fifth part is a big surprise: It offers a detailed demonstration of how does the shared Earth modeling works by example of one oil field. Well, the readers should enjoy the efficacy of the used approachs!

The main message of the reviewed book is as follows: Geological modeling is something more than computer-based programming. In fact, it requires the own language and the proper data organization and management for full-scale exploration of the subsurface environment, and this always means creative thinking and excellence in geology. The reviewer does not exclude that this leads also to the new level of geological thinking. Are you ready for this? Start modeling!

Is there anything not to be found in this volume? Difficult to say, but the subject is really too vast to embrace all relevant knowledge in one book. It should be noted that the authors deal chiefly with the field of petroleum geology and not, say, engineering or environmental geology. Moreover, there is a lot of peculiar tasks

and different geological situations... But the book solves a super-task: it enables us with a general framework, which permits to direct modeling by a right way (irrespectively of the field, task, and situation).

The information in the book edited by PERRIN & RAINAUD is well-structured and easy-to-perceive. A lot of theory, examples, practical solutions, software recommendations, and lengthy lists of references exist there. The authors always pay more attention to general issues, i.e., the "philosophy" of geological modeling, than to technical things – but the latter are not omitted. In other words, they always try to give us the very idea of "how does this work", and this deserves praises. Yes, some explanations seems to be a bit "dry", and many ideas are not so easy to follow. But the readers should be sure: These occur only because of the complexity of the subject, not the authors' writing. The contributors to this volume did all their best to supply the knowledge in the most suitable form, and they did this really well. Although the chapters are written by the different authors, the book does not resemble a mere collection of papers. In contrast, it is something unique. Numerous illustrations (often colourful) occur on pages. Besides others, one can find many excellent explanatory diagrams (e.g., Fig. 5.4, p. 101 demonstrating the essence of the simplification process) and visualizations of software windows captured on the computer's screen (e.g., Fig. 14.6, p. 316). And, of course, there are numerous images of geological models! The book does not bear any subject index, but it boasts by an extensive glossary. The latter explains briefly dozens of terms, both geological and relevant to modeling. Definitions are brief, but professional. Of course, it would be difficult to avoid shortcuts in such a case. For instance, the reviewer disagrees with the statement that sedimentary basin is only "marine or lacustrine area" (p. 385).

The well-thought and talentedly-organized volume edited by PERRIN & RAINAUD is true success! It is a must for all petroleum geologists and engineers, and it is strongly recommended for all geologists who do not loose chances to implement high-tech solutions in their research. Moreover, if one has never had an interest in such a research, she/he should read this book anyway in order to extend her/his vision of the modern geology. This book can be also used as textbook or reference volume. The level of graduate student (or advanced undergraduate) in the Earth sciences and the elementary knowledge in programming are the principal requirements for successful reading. And why palaeontologists should not miss this book? The answer is simple: modeling geologic environment to prospect for fossils is a hot subject (OHEIM 2007), and the reviewed volume permits to understand the essence of such a research. The same is also true for archaeology, where landscape modeling helps making important discoveries (VAUGHN & CRAWFORD 2009) and where this book can also become helpful.

References

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VAUGHN, S. & CRAWFORD, T. (2009): A predictive model of archaeological potential: An example from northwestern Belize. – Applied Geography, **29** (4): 542–555; Amsterdam.

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844. **Quast, D. & Erdrich, M.** (Hrsg.) (2013): Die Bernsteinstraße (mit Beitr. von A. BLIUJIENÉ, M. BUORA, M. ERDRICH, A. KÖSTER, P. MADEJSKI, B. PICENO, D. QUAST, L. RAHMSTORF & J. WEIDIG). – Archäologie in Deutschland (Sonderheft), **4**