

# ***The Geology of Fluvial Deposits: Sedimentary Facies, Basin Analysis, and Petroleum Geology***

by **A. D. Miall**, published by Springer-Verlag, ISBN 3-540-59186-9, 582 pages, 1996, \$69.00.

## Review by **Christopher G. Kendall**

Andrew Miall is a productive writer and this book is another magnum opus, consisting of sixteen chapters and extensive references Miall has synthesized information of fluvial systems in extreme detail, referencing every idea with numerous examples. He has aimed his work at advanced students, researchers, and professional geologists, creating a source book on fluvial systems that is second to none.

The book begins with a discussion on the historical background of fluvial systems, moving onto concepts of scale, and fluvial architecture in terms of profiles in outcrop, classifications, principles of paleocurrent analysis, channels, etc. It discusses lithofacies, the architectural elements formed within channels, stretching from gravel bars to sandy bedforms, tools, and sand sheets. It then discusses architectural elements of the overbank environment, fluvial styles and facies models, moving from gravel-bed braided streams to the fine-grained meandering rivers to alluvial fans and other fluvial distributary systems. Miall discusses the stratigraphic architecture of fluvial depositional systems and their relationship to autogenic and allogenic processes. He investigates tectonic controls on fluvial sedimentation and also the effect of climate. He has an extensive chapter on sequence stratigraphy, another on stratigraphic and tectonic controls on the distribution and architecture of fluvial oil and gas reservoirs, and finally a chapter on case studies of oil and gas fields in fluvial trends.

The book is abundantly illustrated with numerous diagrams and photographs, some of which were generated by the author, particularly the photographs, but many of the diagrams are taken directly from the published literature. Miall's determination to cover the full diversity of topics associated with fluvial systems mean that many overlap one another, and that there is some repetition within the book. This sometimes makes it difficult to follow a coherent train of thought, particularly when details are referred to in one chapter and then are described in another. This does not make for easy reading, but does make for completeness, and if you need information on fluvial systems, it's here. Similar Miall has been almost indiscriminate in his collection of his examples and even though these are referenced profusely, it is sometimes difficult for the reader to recognize the relevance of some these materials. The result is that in places this book can be considered more of a handbook than coherent piece of literature which might be read over a series of days. Miall has strong opinions about many of the items he writes but because he is covering so much information he doesn't always have space to do justice to his ideas or those of others.

Nevertheless the basic premises are stated in this book and are so well referenced that if one finds that a certain part of the text is incomplete or not clear, the reference materials can be quickly found. Miall is a collector and synthesizer of information, who has produced a book which will undoubtedly will be read by many people who study the fluvial systems, whether they are geophysicist, geologists, geomorphologist. Beauty is in the eye of the beholder, but I think Miall would have served his cause better if he had been more selective in the materials he has provided. For instance, not all the diagrams and photographs appear as relevant to the text and the reader needs to practice some translation and thought. Some geological maturity is required to take best advantage of a book of this kind. Most of the diagrams were extremely clear, and as far as I can judge only one had been reversed (Figure 220). The publisher and

the author and his helpers have done a magnificent job in putting this text together. This book will be read for many years to come. Not a book for the faint hearted, definitely a book for the sophisticate who can take the ideas of the text and synthesize them. For instance, I have recommended to my students that they read the chapter on sequence stratigraphy, so that they can gain a grasp of how these might apply to fluvial systems. Similarly, the chapters on the architectural elements of the overbank environment or fluvial styles and facies models are second to none. If you are studying fluvial deposits in any form or shape this book should be bought and be on your shelves. It's a flawed masterpiece but is one of the best books around on the fluvial deposits. Many geologists, like my students and I, will be referring to this text for a long time to come.