

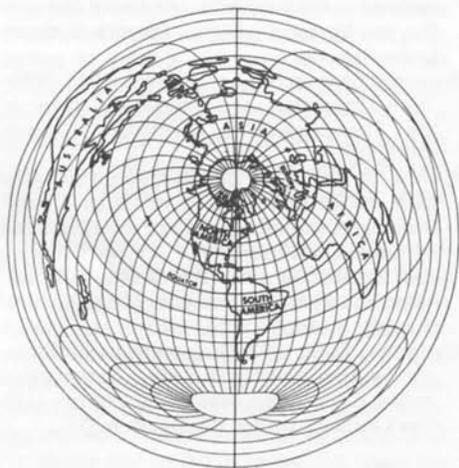
Book Reviews

Principles of Glacial Geomorphology and Geology. I. Peter Martini, Michael E. Brookfield, and Steven Sadura. Prentice-Hall, Upper Saddle River, N.J. 2001, photos, figures, maps, appendix, references, glossary, index, tables. ISBN 0-13-5265-85. \$72.00.

"Principles of Glacial Geomorphology and Geology" is different from most glacier-related textbooks. The principal difference between this text and most others is the wider range of topics covered. As in most glacial texts, the book covers glaciology and glacial sediments and landforms. Close to half of this text, however, covers permafrost and periglacial processes, dating techniques, isostasy/eustasy, migration of biota during glacial cycles, and an extensive global history of glaciation. As a result, the most positive aspect of the book is that one can design a class, using one book, that covers almost any glacier-related topic. The negative aspect of the text, especially for an upper-level class, is that most topics are only briefly covered and other topics related to glaciology and glacial processes are not covered in much detail or are ignored altogether (such as supraglacial, englacial, and subglacial hydrology and surging glaciers).

The book was designed for undergraduate students, either as an upper level glacial class or an introductory level class for students with a reasonably good science background. The text reads well and is written, in most chapters, with a focus on processes. Graphs and simple mathematical equations are presented throughout the text to help explain the processes involved in ice movement, flow regimes in proglacial streams, isostasy, etc. Abundant photographs and figures help to provide effective visual images to accompany the text and to clarify the processes involved. In addition, the authors highlight contemporary issues throughout the text that directly affect students such as glacial hazards, resources, and the perspective glacial history provides to the issue of modern climate change.

The title of the text is intended to capture the scope of the material covered.



However, the book actually covers more than just glacial geomorphology and geology. The text is divided into 4 main parts: I) Glaciology, II) Glacial Geomorphology, III) Periglacial Environments, and IV) Geology. Since the scope of topics covered would be the main attraction for using the text, the following paragraphs outline the topics covered in the textbook. First, a very short introductory chapter (Chapter 1) introduces the concepts of glaciology, geomorphology, and geology, as well as discussing the guiding concepts of gravity and heat.

Part I, Glaciology, covers the principles of ice and glaciers. Chapter 2 introduces the concepts and properties of ice as a mineral, sediment, and rock, and the metamorphism of snow to ice. Chapter 3 presents a glacier classification, mass budget, and movement of glaciers. The glaciology of ice is dealt with rather well; however, glacier hydrology is all but missing.

Part II, Glacial Geomorphology, covers glacier-related erosion, transport, sedimentation, and landforms. Chapter 4 covers glacier erosion with very little attention to the processes of abrasion and plucking and a large focus on erosional features. Chapter 5 is a concise chapter on glacial transportation and deposition. Chapter 6 presents ice dominated glacier landforms such as moraines, stagnation features, and a fairly detailed discussion of drumlin formation. Proglacial hydrology, structures, and landforms, and large glacial floods are the topics of Chapter 7. Chapter 8, on glaciomarine and glaciolacustrine environments, introduces ocean processes, general ocean deposition, and glacier-related depositional processes. In general, Chapters 4, 7, and 8 are the most detailed in this part of the text.

Part III, Periglacial Environments, covers processes "active in cold, but not exclusively glacial areas." Chapter 9 handles eolian environments including wind processes, sand dunes, and loess deposition. Frozen-ground processes including cold-climate weathering, permafrost and permafrost features, periglacial mass movements, and Pleistocene permafrost distribution are outlined in Chapter 10.

Part IV, Geology, discusses a wide range of topics related to glaciers and the study of past glacial environments, Chapter 11, on Quaternary stratigraphy, outlines general stratigraphic principles and dating techniques. Chapter 12 deals with glacial isostasy, global and relative sea level change and the lake level history of the Laurentide Great Lakes of North America. Glaciers in tectonically and volcanically active regions, and an extensive discussion of the migration of plants and animals during the last ice age are also discussed in this chapter. Chapter 13 covers the Cenozoic Ice Age including the pre-Quaternary cooling, ice core data, and details about the advance and retreat of several of the world's ice sheets during the last glacial cycle. Chapter 14 encompasses the pre-Quaternary glaciations. Chapter 15 summarizes the causes of glaciation and climate variations on short- and long-term scales.

Overall, for a textbook that tackles so many topics in about 350 pages, the authors are successful at providing a broad overview of glacier-related principles, processes, and geologic history. There is a balance between providing sufficient background in basic geologic principles for introductory students and providing occasional in depth discussions of modern controversies. It is a book that is definitely worth considering if you are interested in covering a wide range of topics in a course on glacial geomorphology/geology.

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Water in the Middle East. A Geography of Peace. A. Amery and Arron T. Wolf (Eds.). Austin, University of Texas Press 2000, glossary, diags., tables, appendices, index. \$24.95. 0-292-70495-x (paper).

Despite the image that "it is all the same" the Middle East is a paradox in context and poorly understood. Oil rich and the center of three monotheistic religions in the Middle East contrast with political disarray and the availability of resources such as water. The arid empty

spaces contrast with the urbanization occurring throughout the region.

The improved living standard of the rising population and essentially water resources unchanged since Biblical times is driving up the demand for water. Coupled with potential climatic change, future water resources may be even more critical.

Amery and Wolf recognize the convergence of volatile issues such as increasing urbanization, and ethnic, religious and territorial antagonisms. With these issues on the table, the editors have selected 10 essays by prominent Middle East specialists to include Arabs and Israelis, and others to present expressed views on policy and integrated solutions to diverse issues, especially water. Amery and Wolf suggest that peace in the region can be achieved by looking forward; that impediments can be resolved. "Since the people can not turn back history, they must move forward"; they can only do so with a cooperative spirit. The statements reflect a passionate plea which others may indeed reject. However, is there hope?

The text focuses mainly on the Jordan River basin which is shared by Israel, Jordan, Syria, Lebanon and Palestine. The book begins with geographical and historical overviews. P. Beaumont (Chapter 2) examines the historical water use in the Jordan basin to include currently occupied West Bank which geologically retains the productive Mountain aquifer in Judea and Samaria. If a state of cooperation existed between the Israelis and Arabs, it would be sensible to design a joint water-supply project and supply the resource to both sides of the political divide. Conversely technology and skills of the Israelis are at a point where they can provide structured water use, to include desalination on both sides of the border.

S. Lonergan (Chapter 3) notes water in the Middle East being a valuable resource, has also been a strategic target for centuries. In 146 B.C. the Romans salted Carthagian farm fields. Power transmission and desalination plants are frequently primary targets during armed conflicts. A root of conflict in the region is

the growing number of disparities between resource rich and resource poor regions or cultural groups which have created tensions or even deadly conflict.

Following this chapter, the book presents chapters with very different perspectives on water as well as on the region's perceptions of the resource. Topics include an evaluation of environmental and economic issues whereas other contributors discuss international legal principles which could be useful in building alternative and perhaps more constructive regimes in the future.

Someone once said the Middle East has too much history and not enough geography. Clearly the region is complex and settlements are directed by the location of sparse resources. In Chapter 6, F. C. Hof traces the water issues emerging from the Golan Heights negotiations. He prefaces his thesis, somewhat apologetically, by noting his analysis is largely speculative because neither Syria nor Israel has set forth authoritatively their positions. Can meaningful discussion of the water resources set a dialogue at this point?

Several other chapters (P. A. Kay and B. Mitchell, Chapter 7), (N. N. Eliot, Chapter 8) and (G. Rowley, Chapter 9) bring out the deep feelings of political entities in the region. The need for hydro-security and the difficulties preparing for a vaguely defined future in terms of policy and possible disruption in territorial boundaries are the circumstances and the realities of the people.

The editors and authors make a good effort to see that the text is objective and reasonably well balanced considering the feelings and perceptions of the occupants of this old landscape. In reality, however, prior water usage strongly influences current and future issues as does upriver control. In the case of the Tigris/Euphrates who should (or can) dictate discharges across international boundaries? The international community must recognize water as an increasingly scarce resource and a powerful force of political, social and economic instability.

The final contribution by J. Kolars (Chapter 10) provides an overview of the

multiple functions of a river. This chapter, somewhat reverently, examines the many uses, real and philosophical, of fluvial systems. Rivers and water have deep religious implications to followers of Islam, Judaism and Christianity. A river and its valley are an avenue for anadromous fish, birds and people. There is a spiritual, biological and physical connectivity here. Improper stewardship at one riverine site has a negative affect elsewhere. It introduces parasites and diseases along its entire length. Kolars notes that a river is not like a sausage to be cut into pieces and distributed but rather a

unified hydrological feature useful to all riparians along its course. If the functions and problems of rivers can be considered first, then it may be possible to resolve the differences between its users.

The book focuses on surface and ground water issues and the authors' attempt to view water, not as a point of conflict but rather as a focal point of political resolution in the region. It provides for an exercise in tolerance and compromise. The issue of water is each nation's problem as well as each nation's solution to economic stability.

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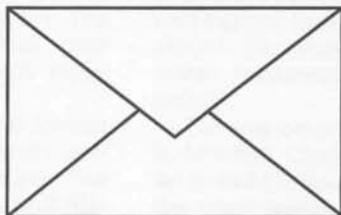
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