

Trenhale, Alan S. (1990) : *The Geomorphology of Canada : An Introduction*. Oxford University Press, Toronto, 240 p., 125 fig., index, glossary, 18 x 23,5 cm, 24,95 Can. ISBN 0-19-54079101

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A chronic problem for professors teaching geomorphology in Canada is the general paucity of an up-to-date introductory textbook providing an integrated overview of processes operating in the Canadian environment. Apart from J. B. Bird's (1972) *Natural Landscapes of Canada* and the Canadian Edition of *Fundamentals of Physical Geography* (Briggs et al. 1989), the needs of the Canadian University geomorphology market at the introductory level, albeit small, have largely been neglected. *The Geomorphology of Canada* by Alan Trenhaile is a reasonable effort at filling this obvious void. As the author states in the preface, his objective was to write an introductory level systematic geomorphology text for Junior undergraduates based on Canadian examples and highlighting Canadian research. To this end, Trenhaile has been only partially successful.

The Geomorphology of Canada is divided into ten chapters which, in principle, encompass a full range of processes and landforms occurring in Canada. Chapter one begins with a broad and very general background discussion on the geologic, physiographic and climatic characteristics of the Canadian environ-

ment. In this chapter the author does a good job of providing basic information on Earth structure and history in a regional Canadian context. Chapters two and three are short summaries of weathering and mass movement processes, respectively. Both chapters plunge abruptly into their respective subjects with little or no preliminary discussion. This may cause difficulties for students without previous background in geomorphology and, due to the regional nature of the examples, may be a particular problem for students from outside Canada. In the next three chapters the author imposes a strong thematic bias on glacial systems by focusing on various aspects of glacial geomorphology. In these chapters; Glaciers and Ice Ages (chapter four), the Glaciation of Canada (chapter five), and Glacial Sediments and Landforms (chapter six), the author focuses primarily on Quaternary glaciations and also incorporates examples of modern glacial activity from British Columbia and Baffin Island. However, the geomorphic continuity between glacial process, theories on glacial origin and glacial sediments/landforms is interrupted by a discussion on Canadian glacial history. The information in these chapters is more detailed than the rest of the book, and even though the author should be congratulated for trying to incorporate recent findings on environmental isotopes, ice origin and glacial history, the technical level of these sections is inconsistent with other parts of the book. By comparison chapter seven summarizes permafrost and periglacial systems (Periglaciation) in a series of short thematic discussions on frost action, permafrost, ground ice, ice-cored mounds, thermokarst and slope process. This approach unfortunately presents permafrost geomorphology as a series of interesting topics rather than a geomorphic system. In comparison with other introductory textbooks which subdivide fluvial geomorphology into separate discussions on (a) fluvial/channel process and (b) river valleys and drainage basins (e.g. Selby, 1985), Trenhaile combines all fluvial process discussions into one chapter under the simple heading "Rivers". Emphasis in this chapter is on fluvial form (e.g. drainage pattern, channel pattern, fluvial landforms) while discussions on process are brief. Hill slope hydrology and the hydrologic cycle, two fundamental process geomorphology topics, are given cursory treatment. Chapters nine and ten discuss coastal processes and landforms, and karst. Coastal systems are discussed in detail (maybe more than is required in an introductory text) with a good balance between process and form. The final chapter on karst is brief and adds little to the book. This text may have been better served by a general chapter that summarizes a variety of geomorphic systems (e.g. karst and aeolian) that have limited significance in the Canadian context.

By focusing the content of this text on geomorphic systems that have had a visible impact on the Canadian landscape the final product still has a strong regional orientation. The text is highly descriptive and includes little analysis, in places the writing style is stunted and uninspiring. There are a few instances of gender specific language and personification.

The page layout with two columns of uneven width is awkward and poses problems for both text and graphics. In an introductory book of this nature, illustrations play a *fundamental role in communicating key concepts*. This book is illustrated with numerous black and white line maps and diagrams which, for the most part, do not communicate effectively. The graphics fall victim to a combination of small page size and the column format. In order to fit the rather narrow columns the publisher has reduced several diagrams so much that considerable detail has been lost. The graphic design lacks a consistent pattern for diagram format, placement, size and labels. For example, some diagrams are full page (no columns) while others are half page or smaller and limited to a single column. On highly reduced small-scale maps (e.g. temperature and precipitation maps of Canada) the legends and map symbols are too dense and loose detail. Also, in a few cases the figures do not illustrate the point being made, for example Figure 2.7 is meant to show talik zones in continuous and discontinuous permafrost, but are not even labelled on the diagram. The biggest shortcoming of the illustrations is the paucity of photographic plates.

A number of terms highlighted in the text are defined in a glossary at the back of the book. Since terminology is always a problem at the introductory level and often a focus of testing, the addition of a glossary is an excellent idea. The author explains that the choice of terms included in the glossary was designed to enhance the flow of the text. However, some important and conceptually difficult terms, or one of a pair of complementary terms (e.g. stress and strain, stoss and lee) have been overlooked while in a few cases rather simple nontechnical terms are included. A short and somewhat incomplete appendix on S. I. Units follows the glossary.

In conclusion, *The Geomorphology of Canada* does not quite achieve the authors aims, although a good effort, it misses the mark on a number of points. It suffers from an awkward format, less than satisfactory illustrations and an inconsistent level of presentation. These problems make it hard to recommend as a primary text, however it forms a useful reference book that could be used together with a more typical introductory geomorphology text to help give a Canadian focus. In a future edition, I recommend the addition of a

strong introductory chapter that would define and explain the conceptual and theoretical foundations of the science of Geomorphology (the term geomorphology is not defined). It could also include a historical section describing the evolution of geomorphology in Canada and key Canadian contributions to the science in general. Furthermore the aims of the text would be better served by a greater emphasis on process and less emphasis on morphology.

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