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Scenic Wonders of Canada— An Illustrated Guide to our Natural Splendors

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The last group of papers addresses a most significant, and from the viewpoint of metallogeny, most important aspect of global tectonics: to what extent are plate tectonics applicable to Precambrian ore deposits? A comprehensive evaluation of Archean to early Proterozoic shield elements and their relevance to plate tectonics (Glikson) finds that small-scale plate tectonics are more consistent with available evidence than models based on modern, large-scale plate motions. The paper does not discuss Precambrian metallogeny as such, but is highly significant in the cogency of its arguments that an uniformitarian projection of modern plate tectonics to the Precambrian is unsupported by existing evidence. A second paper entitled Eras, Mobile Belts, and Metallogeny (Walker) is devoted to the hypothesis that worldwide patterns of mobile belt development occurred in 10 eras from 4.0 b.y. ago to the present. Most of the paper is a compilaton of data on mobile belts including lithologies, radiometric ages and some description of mineralization, considered to provide substantiating evidence for the 10 eras. The question of Precambrian plate tectonics is not seriously considered in the paper. A useful example of inferring orogenic regime from distinctive metallogeny is provided by a paper on the siver-nickel cobalt arsenide association (Badham). Examples from the European Hercynides suggest that this distinctive metallogeny develops in conjunction with a continental margin orogen above a slow-moving, shallow-dipping subduction zone. The presence of Ag-Ni, Co arsenide mineralization in rocks of the 1800 m.y. old Wopmay orogen, specifically the Great Bear batholith, N.W.T. and consideration of regional tectonics is considered to suggest Proterozoic plate subduction. A second example of Proterozoic metallogeny for which a plate tectonic model is regarded as applicable is a diverse mineralogy including ophiolite mineralization, porphyry-type Cu-Mo and Kuroko-type massive sulfides in the Red Sea region (Garson and Shalaby). A third example is the Proterozoic of southern Norway where the distribution of metal provinces and various lithologies is considered to bear much similarity with the Canadian Cordilleran orogen. The author (Torske) concludes that plate tectonics can be successfully applied to this Proterozoic orogen. Finally, the Archean Ni-sulfide mineralization associated with the magnesian lavas of Munro Township, Ontario is not easily related to plate tectonic processes, although an island-arc succession is the best modern tectonic analogue (Arndt). It is quite possible that unusual physical and tectonic conditions, at least in relation to our understanding of modern tectonics, must be considered to understand Archean metallogeny more fully. This section leaves a distinct impression that Proterozoic metallogeny may be usefully analysed within a plate tectonic framework drawing heavily on modern orogens, but that a simple uniformitarian extrapolation of modern tectonics to the Archean is beset with subtle pitfalls.

Metallogeny and Plate Tectonics provides a timely and needed overview of the impact of the new global tectonics on the mineral deposits field. The overall quality of papers is good, although there is a certain unevenness with respect to relevance to the main theme. The hallmark of the book, however, is that it contains several unusually perceptive, absolutely first-rate contributions. The organization of a rather diverse spectrum of material has been skillfully handled by the editor. Clerical errors are minimal. In general, figures, maps and diagrams are adequate although occasionally reading of legend and numerical data on maps is difficult. The book certainly deserves a place in the library of any serious student of mineral deposits, whether one's interests lean toward mineral genesis or whether one's responsibilities lie in the area of mineral exploration. Indeed, it is perhaps in the latter area, at least in the broader aspects of mineral exploration and prospecting, where spin-off from the new global plate tectonics may be most dramatic.

MS received December 6, 1976

Scenic Wonders of Canada—An Illustrated Guide to our Natural Splendors

Readers Digest Association (Canada) Ltd, in conjuction with the Canadian Automobile Association, 384 p., 1976. $24.95

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Canadians who appreciate nature are fortunate. Our land offers something for almost everyone - the gently rolling terrain of Prince Edward Island, the rugged majesty of the Rockies, the temperate climate and subdued landscape of southern Ontario or the lonely beauty of Ellesmere Island. It may seem to many that our natural beauty, being so abundant, needs only to be enjoyed. Fortunately in more densely populated countries and indeed in some parts of our own land it long ago became obvious to a concerned few that enjoyment implied responsibility and certain lands were set aside. Banff, started in 1885, was the first of a variety of national parks. National parks cover 50,000 square miles, provincial parks 110,000 square miles, two thirds of the latter area being in Quebec with its extensive wilderness areas. In addition there are many hundreds of historic sites, conservation areas and other features that mark and preserve our heritage. The national parks, few in number but large in size, are for the most part wilderness areas whereas the provincial parks, in addition to large expanses such as Algonquin Park, include many hundreds of small areas devoted to specific scenic features. Some may wish that our parks were more numerous and more restrictive, others may feel that more varied uses should be permitted but at least we have a foundation on which to build.

Many of our parks were created to preserve outstanding natural features whether geological such as the badlands of Alberta or ecological such

as Point Pelee or were set aside to preserve endangered wildlife such as the Wood Buffalo. *Scenic Wonders of Canada* is built around such features and by a skillful blending of outstanding colour photographs, a well written text and clearly presented, competently written "closeups", succeeds in some 375 pages, in giving the reader an appreciation for the natural beauty and natural history of Canada.

Forty-two outstanding scenic features are presented in the book. They range from Gros Morne National Park in Newfoundland, through Quetico Provincial Park in northern Ontario, the Cypress Hills of Saskatchewan, and the Queen Charlotte Islands to our newest national park, Auquittuq on Baffin Island. A general text including historical comment introduces the principal subject; other attractions are briefly noted in paragraph form and the entire feature illustrated by a generalized relief map on which all points of interest are clearly shown. These maps are obviously not intended to be route maps as roads are not numbered nor are major highways marked.

Of particular interest are the one-page "closeup" articles that accompany each of the forty-two descriptions. They are concerned with topics such as physical geology, botany, ornithology, forestry, or the cause of the tides, and by themselves would be a good introduction to natural history for younger readers. Although we are shown how glaciers carved the fiords at Gros Morne, how caves form and how badlands develop, fossils do not seem to have attracted the writers although, of course, dinosaurs make their appearance. Equally lacking are any illustrations of the beauties of the mineral world.

This book should have broad appeal. It provides factual information interestingly presented, a collection of first-rate coloured photographs and the incentive to get out and see more of Canada's natural beauty.

MS received October 28, 1976

The Landscapes of Southern Alberta

By Chester B. Beaty
University of Lethbridge Production Services,
95 p., 1975.
$3.50 (paperback only)

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"Life would be a pretty dull affair . . . without some interest in and understanding of the natural world in which we find ourselves." Such is the author's rationale for writing an elementary treatment of the geomorphology of southern Alberta. The book is designed for the layman (which accounts for the fact that it can be seen for sale in several drugstores in Calgary) but geologists and geographers not too acquainted with Alberta would probably learn something from reading it.

Southern Alberta can be divided on both structural and physiographic grounds into mountains, foothills, and plains provinces, and this natural subdivision provides the organization for the book. Introductory chapters are concerned with the traditional battle between tectonic and gradational forces and with bedrock geology. Various processes and structural features are defined, and rocks, geologic time, and southern Alberta stratigraphy are classified in a simplified fashion. The meat of the book is a chapter-by-chapter treatment of mountains, foothills, and plains. For each province the author first describes the general geomorphic characteristics, including bedrock structure, effects of glaciation, and common landforms. He then discusses particular features which are unique or whose origins are debatable. These include the Frank slide, the Oldman River water-gap, and patterned ground on Plateau Mountain (in the mountains); the Foothills Erratics Train and Porcupine Hills meltwater channels (in the foothills); and aligned coulees, igneous stocks, prairie mounds, and hoodoos (on the plains). Treatment of controversial subjects (e.g., origin of prairie mounds) is generally fair. The author promotes his own theories of coulee alignment and distribution of slumps (control by Chinook winds in both cases) but concedes nonuniversal acceptance.

The text is augmented by several line diagrams and many black and white photographs, which are adequately reproduced. The author notes that most of the photos were taken from major highways and roads, so that the scenes shown would be ones that people actually see. Another useful feature is a list of references at the back of the book.

As a popular, natural history-type work this book is a success (both my opinion and that of some laymen I know). The writing style is casual, perhaps conversational, with a touch of humour here and there; presentation of ideas is, for the most part, clear. But there is the occasional lapse. The lay reader would be confused by the poorly-presented classification scheme for mass movement and would wonder why some terms are used in tables long before they are defined in the text. He would probably be perplexed after reading the explanation of patterned ground (admittedly a very difficult subject to handle). More experienced readers will be surprised to learn that plate tectonics is based on the concept of "moving surficial slabs of rock" and that the earth's crust was created 4500 million years ago. These and a few other examples of misleading statements are unfortunate but perhaps forgivable in a work of this sort, where gross simplification is sometimes necessary.

The book would serve well as a text in Alberta high school science courses and low-level undergraduate geography courses. It is presently used as a textbook for a natural history course at the federal penitentiary at Drumheller, Alberta, and reportedly has been well received by the inmates.

MS received October 11, 1976