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Comptes rendus

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To celebrate the Centenary of the British Columbia Bureau of Mines (BCBM), a compilation of papers on mineral exploration by drift prospecting in the Cordillera has been published by the Geological Survey Branch of BCBM. The volume includes 27 papers by diverse workers, including representatives of industry and universities, and of both provincial and federal geological surveys, and they reflect a wide variety of exploration methodologies and approaches. The papers touch on topics related to ice flow dynamics, glacial history, exploration case histories, compositional analysis of drift, lake and stream sediment geochemistry, and geophysical methods. The diversity contributes to the overall strength of the publication, reflecting state-of-the-art Quaternary geology applied to drift prospecting as well as innovative and new research in geochemical analysis. Not all of the research relates to the Canadian Cordillera, and not all is specifically applicable to mountainous terrain: some describe investigations in the Canadian Shield and Appalachian regions in central and eastern Canada. The principal economic emphasis (six papers) is on gold exploration.

The best of the papers, written by both government survey and industry geologists, demonstrate the importance of glacial sedimentology, stratigraphy, and ice flow history to drift prospecting (e.g. Jackson, Reimchen, Plouffe and Jackson, and Levson and Giles, among others). They reflect the profound shift in the application of Quaternary geology to mineral exploration and geochemistry that has occurred in the past decade, and illustrate how drift prospecting has grown beyond chasing geochemical anomalies and mineralized erratics. The papers show the importance of stratigraphy, sedimentology, and sediment provenance to mineral exploration and represent the increasingly sophisticated standards of Quaternary fieldwork and laboratory methodology.

Useful summaries of methods and of the philosophic and scientific basis for drift prospecting are given in papers on ice flow history and Quaternary geology (Ryder,

Proudfoot *et al.*, Bobrowsky), as well as in introductory parts of several others. Aspects of drift prospecting characteristics in the Cordillera, including reference to topographic effects on ice flow and on the preservation and distribution of buried, ancient placer deposits, and to the widespread occurrence of thick glacial lake and fluvio-glacial deposits, are themes explored in a number of papers (e.g. Plouffe and Jackson, Jackson, Reimchen, Levson and Giles, Hicock, Roed). Several papers describe lithological analyses of till as a means of tracing mineralized boulders and interpreting ice flow direction and till geochemistry. They include a background summary of lithological analysis and provenance determination (Bobrowsky), as well as field-based studies of till lithology and glacial dispersal trains in the Cordillera (Broster and Huntly) and eastern Canada (Rappol). In addition to ice flow history, they emphasize the role of glacial dynamics on the development of glacial dispersal trains. Buried placer deposits, some of which are gold-bearing, are described in two well written papers (Jackson, Reimchen) that focus on the paleogeographic distribution and stratigraphic positions of those deposits.

Although the focus of much of the work relates to till and buried placer deposits, there are two papers on lake and stream sediment geochemistry (Earle, Cook), and one on biogeochemistry that includes detailed review of sample methodology (Dunn). The paper on lake sediment geochemistry by Cook considers limnological factors and the origins of the lake sediments, among other factors, in his interpretation of gold in lake basins.

Field methods applicable to the Cordillera, including a summary review of equipment and sampling techniques, are clearly described (Plouffe). Laboratory methods are examined in several papers, reflecting the importance and increasing awareness of geochemical and mineralogical partitioning among size fractions (e.g. Delaney and Fletcher, DiLabio, Shiels, Lett). The papers of Shiels and DiLabio describe the results of innovative research on trace element partitioning by the Geological Survey of Canada, defining one of the most important directions of current research in geochemical analysis of glacial sediments. They illustrate how the mineralogical differences among different size fractions that result from glacial processes can affect

geochemical analysis results. Their papers will serve as important references for future work.

The equipment and methods employed by the GSC to separate the clay-sized (<0.002 mm) fraction of sediments are also described as a timely contribution, given our increasing understanding of partitioning (Lindsay and Shiels). Included in the book is a broad summary review of sample preparation and analytical methods commonly used by exploration and government surveys, including description of how methodology has changed (Lett).

Three papers describe geophysical methods; seismic (Pullan), borehole logging (Douma), and resistivity mapping (Best). All include a broad background review of theory and equipment limitations, although supporting field-based examples are from the clay belt of central and northern Ontario.

Two very useful components of this volume are a summary paper of drift exploration data from assessment reports (Kerr) and an annotated bibliography of drift prospecting studies (Kerr and Levson). The assessment report summary illustrates the wealth of information that is available in public records, and includes a well constructed summary table for one NTS area in the central Cordillera (Manson River). The bibliography is broadly based, including references to summary and benchmark papers, as well as to those directly concerned with drift prospecting in British Columbia. The annotations and cross-indexing are a useful guide to the references.

The publication appears in the soft cover "Current Research" format common to provincial and federal surveys. Among the papers, writing standards vary, and some are either poorly written or too long or, unfortunately, both. Wide variations in the quality of figures and photographs reproductions can make it difficult to follow the text, and the layout style gives too much visual emphasis to titles, with little distinction between heading weights. Despite the criticism of format, this volume includes a strong collection of papers, representing a broad range of topics in Quaternary geology and their application to drift prospecting methods as well as for its examples of exploration applied to specific problems and areas in British Columbia.