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Magmatic Platinum Group Element Environments in Canada: Present and Future Exploration Target Areas

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the thread connecting many of the papers scattered in the book. The authors conclude with the concept of "defensive mine planning" and a suggested list of relevant measures, the majority of which have already been incorporated in the mandatory environmental impact assessment of any significant proposed mining operations in North America. There are two additional overview papers in the group. Augmented with a case study, Wolkersdorfer lucidly describes the applications and outlook of tracer tests in mines. Bowell presents a well-referenced and comprehensive review on the hydrogeochemical dynamics of mine pit lakes, despite some complicated diagrams that fail to clearly demonstrate the detailed processes involved or contain apparently unbalanced chemical equations. Two potentially contentious papers are also found. One is on the prediction of mineral weathering rates at field-scale based on simple scaling of physical parameters without considering detailed water-rock interactions. The other is on modeling sulfide oxidation in an unsaturated soil with the conclusion that pyrite oxidation by ferric ion is not faster than that by oxygen. The remaining three papers include a case study on the hydrogeological and geochemical interactions of adjoining mercury and coal spoil heaps in Spain, a brief description of alkaline mine drainage from metal sulfide and coal mines in Svalbard and Siberia, and an assessment of liabilities at a uranium mine the Slovak Republic. Incorporating few detailed hydrogeological and hydrochemical data, the last paper hardly fits the theme of the book.

In conclusion, compared to many conference volumes, this Geological Society Special Publication is a good-quality product. It contains many excellent overview papers and case studies. Readers interested in the hydrogeology of coal mines, in particular, may find many papers highly informative. Readers with a special interest in detailed mine water geochemistry, on the other hand, may find many of the papers lack the more vigorous data analyses commonly emphasized in more specialized publications. Moreover, the wide variety of topics covered in the absence of a synopsis chapter or preface makes navigating through the book somewhat difficult. At a price of US$142.00, the reviewer does not think that the book belongs to the must-have category.

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Special Publication, CD-format, $25.00

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A few years ago I had the opportunity to attend an oral version of this presentation. I remember an inspiring talk, full of relevant facts and data, delivered with inspiration and enthusiasm by a dedicated professional who was presenting a significant part of his life's work. Included in this CD is a vastly expanded version of the original lecture, including 202 images (slides) many of these with attached, helpful and informative speakers notes, an extended abstract and a list of references. The author promises that the user of this CD will not only become knowledgeable about Platinum Group Elements (PGE) and their significance to our civilization and way of life, but also become convinced that Canada is endowed with the geology that will make it "the world's next major source of PGE". A tall order, one may think, bearing in mind that Canada currently produces <10% of the world's PGEs. However, this is exactly the impression one is left with after reviewing the slide show.

The presentation is divided into sections based on the genetic origin of PGE deposits: a) layered intrusions; b) flood basalt; c) komatiitic magmatism; d) greenstone belt magmatism; e) alkalic magmatism; f) orogenic magmatism and g) impact-related magmatism. These major divisions are subdivided according to the physical configuration of the mineralization. For example, layered intrusions are subdivided into stratiform and contact deposits, with the stratiform deposits further subdivided into chromite and sulphide-associated deposits. Each example of these topics is illustrated with one or more images, running the gamut from basic geological sketches to maps and elaborate geological block diagrams replete with geological and geochemical information. An added feature, entitled "Future exploration targets" on the CD's frontispiece but named "New opportunities" within the presentation, is appended to each of the topics. These "New opportunities" are a veritable smorgasbord of well-thought-out grassroots PGE exploration leads and ideas that may lead to discovery of new resources.

The first part, dealing with sulphide-associated PGE occurrences in layered stratiform intrusions, begins with an overview of the geology of the Muskox intrusion and its PGE concentrations, followed by descriptions of the geology, geophysics and PGE discoveries of the Fox River sill and the Mechanic intrusion in New Brunswick. The next segment, addressing stratiform PGE associated with chromite, features the geology and mineralization of Crystal Lake, the Muskox intrusion, the Bird River sill, Big Trout Lake, the Menarik intrusion and the Puddy Lake intrusion. This is followed by a segment highlighting PGE mineralization concentrated as a result of the physicochemical interaction of intrusive rocks and host rock. Examples are provided for the Muskox Intrusion, Pyrrhotite Lake, the Fox River sill, the East Bull Lake, Agnew and River Valley intrusions of the Sudbury Basin and finally, the Lac des Isles Intrusion in

Ontario, site of our single active Canadian mine producing exclusively PGE.

The second part deals with flood basalt magmatism and is subdivided into two segments: continental and oceanic environments. The continental environment features the massive intrusions of the midcontinental rift system, such as the Duluth gabbroic complex and associated intrusions, the Nipissing diabase, the huge Muskox Coppermine Mackenzie intrusive event and the Franklin intrusives in the Arctic. The oceanic segment, dealing with flood basalt environments, is restricted to the Wrangellia terrane. Remnants of Wrangellia exposed on the western edge of the continent from Oregon to Yukon and Alaska contain PGE-bearing peridotite intruded into oceanic rocks, known as the Kluane belt.

The third part is devoted to PGE accumulations in komatiitic magmatism and highlights the Paleoproterozoic Circum Superior Ni Cu Fe sulphide-bearing occurrences. They range from a vast number of minor occurrences and showings to the exclusive "world class" rank of the Thompson and Raglan deposits. Slides provide glimpses of the geology and mineralization of the Thompson Nickel belt, the Fox River sill, the Cape Smith-Wakeham Bay belt and the Labrador trough. A look at the PGE potential of komatiites in the Hearne Province (including the Rankin Inlet deposit), the Ketvet Group the Prince Albert Group, form a fitting end to this vast collection.

The fourth part, on Greenstone-Gneiss Belt Magmatism, highlights a grab bag of small but high-grade PGE occurrences. A segment on gneissic host rocks begins with the Rottenstone deposit, continues with the Gordon-Werner Lake area and ends with the Namew Lake deposit. The second segment starts with an image of the of the La Ronge, Lynn Lake and the Flin Flon Domain.

A further part deals with PGE deposits associated with alkalic magmatism. Included are Pt placers associated with chromitite bodies in zoned Alaskan intrusions and PGE associated with sulphide, both as massive contact accumulations and in reef-type environments such as the Salt Chuck and Quetico intrusions and the Coldwell complex. The largely overlooked potential of felsic intrusions and associated Cu-porphyry environments as PGE hosts is demonstrated with examples from the Entwine Lake Complex and Cordilleran alkalic porphyry copper deposits. Two examples of PGE mineralization associated with orogenic magmatism are illustrated by the Mechanic Intrusion in the Appalachians and the Giant Mascot in the Cordillera.

The presentation ends with a visually appealing segment on impact-related magmatism and the Sudbury basin's PGE mineralization. Finally there is a review of future PGE exploration targets and the tools to find them.

This CD is a major compendium on PGE in Canada that is best used as a starting point for those interested in exploring for this important, useful and valuable family of elements. The insights gained may help to find additional deposits. I hope that a future updated edition of this volume is planned. In this updated edition I would suggest the inclusion of a searchable database listing the names of the occurrences. Hopefully an updated edition will also deal with the spelling gremlins that plague a number of the images in this edition.