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CONFERENCE REPORT

North Atlantic Minerals Symposium

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The first North Atlantic Minerals Symposium convened in Dublin, Ireland 19-22 September 1999. It was spawned from an official economic exchange, "the Memorandum of Understanding," between the governments of the Republic of Ireland and the Province of Newfoundland and Labrador. Unofficial links long pre-dated this meeting: the Irish ancestry of many Newfoundlanders and the geologic commonality of the two islands. Geological staff of the two geological surveys, led by Gerry Stanley of the Irish Survey, created an excellent 3-day program of talks that comprehensively covered the economic status of mineral development in the two regions at the end of the 1990s. The meeting was held at conference facilities on the hallowed campus of Trinity College in Dublin centre. The symposium was designed, and succeeded, as "a business event and opportunity." More than 200 attendees represented a cross-section of the mineral industry from both sides of the Atlantic. Well-planned social functions in impressive halls, with warm Irish hospitality and music created a warm ambiance for casual discussion.

Forty-two talks were presented in parallel sessions on metallic and industrial minerals. Two keynote talks opened the symposium with inventories and histories of metallic mining in Europe (Colin Andrew) and eastern Canada and Greenland (Tom Lane). Both talks emphasized the significant mineral potential and recent discoveries in both regions. The challenges of both regions differ. Europe has perceptions of being mined out after 2000 years, and of difficulty of development in a heavily populated region. In the western Atlantic many areas are remote and long, harsh winters and ice-locked seas drive up exploration and development costs. In the Atlantic Provinces many mineral deposit targets are small and only attract junior companies.

Two plenary sessions at the beginning and end of the conference analysed the present difficult economic times and how development financing and choices of companies are influenced. Over the past two decades the value of metal production has remained the same while the cost of mineral exploration has doubled (Michael Doggett). Financial institutions, as a result, make loans with great care. Key aspects, such as low debt to equity, completion guarantees, projected cash flow, political risks and guaranteed government partnerships, are meticulously reviewed (Ian Henry, Barclays Capital). Peter Gillin of Rothschilds noted that only a few large and quality projects are being financed. Smaller marginal projects are reliant upon creative financing (*e.g.*, convertible debt, subordinated securities, and corporate bank loans). Gerry Harper of the Prospector's and Developers Association of Canada pointed out how early-stage, high-risk exploration is increasingly dependent on equity financing of junior companies, with financing which is well below a needed US$4 billion per year. John Boddie (Vancouver Stock Exchange) outlined how the Canadian junior market was recently consolidated to improve accessibility to venture capital and accountability to investors. The Irish Stock Exchange (Dierdre Somers) has recently followed the Canadian formula and created listing opportunities for companies without mine assets, but with initiative to develop exploration opportunities. Sean Finlay, in his review of mining in Ireland, pointed out that more than 80% of discoveries in Ireland were made by small companies with little or no mining inventory.

Hugo Dummett (BHP) presented the major company viewpoint: BHP will work only in countries where large, high-value ore deposits are found and where laws and governments are receptive to development. David Whitehead (Billiton) echoed this view, but emphasized that the developed world around the North Atlantic provides the best reward *versus* risk potential. Similar to junior discoveries, the key to significant mineral discoveries in major companies is the commitment of dedicated individuals to use innovative ideas and new technologies in areas overlooked by others.

A number of papers reviewed specific mining developments in Ireland. Mining of zinc, gypsum or gravel is confronted by a well-populated, agricultural landscape with stringent environmental constraints. Three zinc mines will produce nearly 380,000 tonnes of zinc metal per year over the next decade, thus making Ireland the fifth largest producer of zinc in the world (Finlay, O'Reilly, Cunningham). In spite of this success operating in Ireland is a challenge. Operating costs are high. Deposits are deeply concealed below thick limestones, where costly drilling is the only certain technology. After discovery, a long lead time of 8-10 years is required prior to mining, and constraints on permitting do not allow preliminary bulk testing of ores. Similar constraints require stiff regulations for open pit gypsum mines and gravel excavation (Kent, Shiels). Due to the

extraordinary growth in Ireland, retrieval of aggregate from the sea floor is being surveyed (Hollinsworth, Kennedy).

A variety of papers described mineral development on the western side of the Atlantic. Iron Ore of Canada (Ernest Dempsey) in Labrador City operates at higher cost than world competitors owing to climate, distance from markets, and grade and beneficiation of the ore. But the bell weather of the province's mineral production has committed to the long term through restructuring and plant modernisation. At Raglin nickel mine, Ungava, Quebec, development started more than three decades after the discovery. Groundbreaking agreements with the aboriginals, and innovative engineering design paved the way to economic development. However, new technology, pressure acid leach that will recover nickel and cobalt from large oxidized deposits in Australia, threatens the economics of nickel sulphide mines (Tony Green). Peter Dimmell emphasized that mineral development in the province of Newfoundland and Labrador is led by prospectors and junior companies. The number of mineral discoveries is proportional to the amount of exploration spending. Presently junior and major mining companies are working with landholders to develop base metal and gold deposits.

Several papers illustrated how new science and ideas are aiding discovery. In Labrador, mafic intrusions that host the Voisey's Bay nickel deposit contain a distinctive multi-stage mineral chemistry of MgO-enriched and nickel-enriched olivine crystals that indicate the presence of substantial nickel sulphide deposits (Tony Naldrett and Andy Kerr). Volcanics associated with sulphide deposits in central Newfoundland have a distinctive suite of trace elements. This rock chemistry in combination with new structural reconstructions and new processing of airborne geophysics should result in new important discoveries (David Evans). Widespread potential for high-grade, bulk mineable epithermal gold deposits has only recently been recognized. Careful mapping of distinctive silica textures can delineate prospective rocks (Sean O'Brien and David Evans).

In the industrial minerals session, papers noted unrealized potential. The dimension stone industry has just started in Labrador, Newfoundland and Ireland where labradorite, black granite, and black limestone are attracting interest (Hall, Meyer, Feely). Baryte has maintained a lucrative market in Ireland (Grennan). Although growth in industrial minerals is static (Coope), specialized markets such as fillers (calcium carbonate, kaolin and talc) have significant growth potential where processing and quality is available (Harbin).

Several field trips at the end of the conference gave visitors the opportunity to visit the three zinc mines, new gold discoveries, and industrial mineral development. In summary, the first North Atlantic Minerals Symposium kicked off the cross-Atlantic liaison in the right way. The varied program of excellent speakers painted the realities of the mineral business at the end of the century. The high calibre of the program attracted many important representatives of industry and government and therefore achieved the original objective of a "business opportunity." The government of Newfoundland and Labrador will host the second NAMS in May 2001. The meeting will be held in conjunction with the GAC-MAC Annual Meeting in St. John's, and promises to provide an interesting comparison of geoscientific studies from both sides of the Atlantic. It is hoped that the initiative begun in September 1999 will lead to many similar future meetings between Europeans and North Americans.