

**“Investing for Economic Sustainability”
The Third Atlantic RESEARCH MONEY Conference
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Conference Proceedings
prepared by Tim Lougheed

Opening Remarks
Jeffrey Crelinsten, Co-publisher, RESEARCH Money

Conjuring the iconic image of the hardworking ant and the layabout grasshopper, Crelinsten asked the audience to consider which perspective was adopted by their institution — bracing for an uncertain future, or simply enjoying the good times and taking your chances with the future. Beyond simply preparing for what might lie ahead, though, the conference is intended to explore how we can adapt to change. At first glance, the metric for success would seem to be as simple as making money; however, Crelinsten reminded everyone that many institutions are dedicated to a higher purpose, creating an economic environment in which profit is possible. “Are they enablers, or are they a drag on success?” he asked.

“Inertia in our educational institutions, our regulatory bodies, our research institutions, our economic development institutions — they hold us back.”
Jeffrey Crelinsten, Co-publisher,
RESEARCH Money

He then introduced the concept of “cultural lag”, the notion that social and cultural institutions do not keep up with changes driven by innovation. “Procedures, processes, decision criteria — they become entrenched. Attitudes and habits of mind also get entrenched.” Nevertheless, the lag means that the consequences of not adapting to change are not apparent to the people who are involved. “And if that lag persists, it can be disastrous.”

Opening Keynote: From Vision to Action — Identifying and Realizing Opportunities
Jerry Byrne, President and CEO, DFB Group

Crelinsten introduced Byrne as an unusually accessible entrepreneur, one whose lists himself as the primary contact on his company’s Web site, along with his cell phone number. Describing him further as a decisive, global player who has negotiated deals with international companies and foreign governments, Crelinsten portrayed Byrne as a “company builder and an astute business man.”

Byrne began by referring to the paramount importance of safety in his company’s work, and recalling its once-dismal record in this regard. The firm began as a small family operation in 1932, repairing, maintaining, field-servicing, and custom fabricating equipment on the waterfront. Amongst the company’s strengths has been its response to emergencies, such as patching holes in damaged ships. However, after several decades of growth, the company found itself unable to grow any further. Byrne started a dramatic re-modeling of the entire operation

less than a decade ago, starting with changes in the executive structure, ISO 9001 certification, and a fully up-to-date IT infrastructure. What began as a “mom and pop shop”, he concluded, has become “a really nice group of companies that are strategically placed to take advantage of the opportunities that are coming down the road.”

Revenues, which had been stagnant at around \$1 million annually, began doubling in 2002. He predicted that this year they would rise to \$100 million. The number of employees has likewise grown. Above all, he emphasized the major turnaround in safety, turning the worst record in the province to the best, going 821 days without any kind of lost-time incident.

None of this progress can happen without innovation, he insisted, crediting R&D with the ability to act on innovative ideas. By way of example, the DFB Group manufactures ropes capable of towing icebergs, sophisticated launch platforms for remotely operated underwater vehicles, and ocean floor support structures used in the oil and gas industry.

Byrne then listed the keys for identifying these kinds of major opportunities: vision, strategic planning, smart risks, financing, prioritization and control, relationship marketing, putting people first, and persistence.

Vision: “Leadership has less to do with position, than it does with disposition. The right attitude allows you to see and realize opportunities.” In fact, he added, good vision is much more scarce than commodities like capital.

Strategic planning: “Good fortune is what happens when opportunity meets with planning.” His company’s goal is manufacturing that stands the test of time, just as classic works like the Parthenon have done.

More specifically, the company’s 2008 strategic vision statement set the goal for DFB Group to become the “number one choice of employees and customers in the oil and gas marine and industrial markets.” Byrne noted that this was the first time employees had been mentioned before customers, since “whoever’s got the best work force will do the best work and get the best opportunities.”

“We’ve gone from the mom-and-pop shop on the waterfront to an internationally based company, and we ship around the world. We do it by putting people first, creating strong relationships based on a culture of respect, integrity, and community.”

Jerry Byrne, President
and CEO, DFB Group

Relationship marketing: Byrne summarized his outlook with some fundamental values applied every day: be safe, take care of each other, be innovative, have fun, build great things. “Pretty straightforward, pretty simple, quite powerful, we think.”

Returning to his analogy of the Parthenon, he suggested that the four founding corners of any successful venture are safety/environment, relationship and service development, operational excellence using continuous improvement techniques, business intelligence. Together

with the right people, these four corners represent the best value proposition for the customer, regardless of the actual price. “With that you can build profitable growth, and with profitable growth you can reinvest in your assets and increase your efficiency.”

Smart risks: “Risks must be taken, because the greatest risk is to do nothing.” Byrne said the taking of any risk calls for an honest appraisal of the situation being confronted, with all possible courses of action. “The bottom line is: make decisions, accept the consequences.” He added that the ability to take risks can be inhibited by an insatiable desire for complete knowledge, and a need to play it safe. Instead, his company does not avoid risk, but looks for ways of mitigating it, specifically through a wide range of government programs offered with just that goal in mind.

Financing: Byrne endorsed Warren Buffett’s dictum of not investing in any business unless you understand it well. Once you have done so, many sources of funding become feasible, such as commercial banks.

“It’s all about hunting versus farming,” he argued. He explained that aggressively seeking out business tends to cause more problems than it is worth, while nurturing healthy business relationships is far more productive in the long run. Similarly, Byrne added, friendships founded on business tend to be much sounder than business founded on friendship. Likewise, relationships with governments — from the local to the international level — have also proven to be well worth nurturing.

“If you see an opportunity, you feed it properly, you give it everything it needs to grow, then the outcome can be spectacular — and has been for us.”
Jerry Byrne, President and CEO, DFB Group

Byrne concluded by referring to the goal of becoming a \$1 billion company, suggesting that the current economic downturn is no more than a glitch and a great deal of expansion is possible across the country, including major energy projects on land and at sea.

“In summary, it’s vision, innovation, strategy, investment, organization, and an attitude about never giving up,” he said, citing former US president Calvin Coolidge: “Persistence and determination alone are omnipotent.”

Asked afterward about the role of research and development in his company’s success, he referred back to the key role of organizations like IRAP or ACOA to support these activities, which in turn become crucial for winning the confidence of lenders such as banks. Similarly, they partner with other organizations that share an interest or expertise in specific R&D undertakings.

Panel 1: Research Collaborations and Regional Business Successes

Panelist: Jock English, President and CEO, IntelliSys Aviation Systems

Panelist: Derrick Rowe, Chairman, Marport Deep Sea Technologies

Panelist: Michael Scott, President, Precision Biologic Inc.

Moderator: Glenn Janes, CEO, Research and Development Corporation

Janes began by asking the speakers for an overview of how their firms regarded the role and value of R&D activities.

English said his operation began by identifying a need among small airlines that could not afford a great deal of IT support, supplying them with products such as reservation systems. To date they have some 22 clients, expanding globally to places as far flung as Yemen and Macao. He credited this expansion to their ongoing research efforts, marshalling the resources of the entire firm, which has 31 employees.

Rowe explained that the technology wielded by his company — underwater communications, processing, and sonar — emerges from military and commercial fisheries applications, many of which have emerged from academic settings. His company has therefore developed formal ties to institutions such as Simon Fraser University, MIT, and Woods Hole. With specific reference to military aspects of this technology, he noted that Russia has turned out to be a prolific source. France has been another place where some of the best equipment in the world is being designed and built. Last year they spent some \$3 million on such activity.

“We found our technology based on R&D through searching the world for best in class and having no fear.”
Derrick Rowe,
Chairman, Marport
Deep Sea Technologies

Scott recounted how Precision Biologic got into R&D because of a specific problem with part of its narrow core business, which is manufacturing specialized reagents and controls for blood coagulation testing. After polling their customers about what they did not like about these products, the company completely reinvented its offerings, moving to a frozen format in the early 1990s. The result was so successful that they turned exclusively to this approach as a means of building the business. They have since introduced about 30 products through this kind of collaboration with customers.

“Basically we said, ‘If we work with our customers as partners all the way through, not only does it give the benefit that we find out what the need is, but it actually takes care of all the marketing.’ So all of our business development has been done through referrals, working with those end-users.”
Michael Scott,
President, Precision
Biologic Inc.

Janes then asked each panel member how they assigned R&D in the context of planning for the future, then how priorities are subsequently determined and sustained.

English presented the challenge of stimulating employees to build an IT product line that stays ahead of evolving industry standards. An annual meeting with clients, who are brought in from around the world, sets priorities for improvements that should be made. The most promising or important of these objectives are then turned into dedicated R&D projects that are regarded as “billable”, meaning some kind of outside funding for them has to be obtained. “Once we capitalize that project, we track it as we would any other billable time that we’re doing for one of our clients. So it gives our staff legitimacy. Through this process we

have not just this one set of eyes and ears but we have about a dozen sets of eyes and ears that are continually watching the market and bringing ideas into the company.” By way of example, he pointed to the growing number of services now regularly found on airline Web sites, such as the ability to buy a meal in advance. English insisted that his company’s well being depends on the ability to anticipate and deliver these kinds of innovations.

Rowe put the proposition more bluntly. “The money goes where the money comes from. When we enter into any R&D, it has one focus, and that’s the customer at the end.” He added that the list of clients for some of their more sophisticated products may be quite limited, making it all the more crucial to generate a sound return on anything that is undertaken. In this respect, then, he emphasized that “D” was more important to his firm than “R”. Put another way, it means that the research problems tend to be tackled and solved well in advance of the development phase of any project.

Scott distinguished the uniquely bilateral goals of R&D in the health care industry, summarizing the outcome as “good to the customer; invisible to the regulator.” Organizations like the FDA or Health Canada have comprehensive and demanding specifications for any new product, so it is worth making an innovations look as familiar as possible to such regulators. At the same time, end users should perceive these innovations to be much better than existing products. “It’s a very narrow window that we have to find. If we go for ‘new to world’, then it gets too complicated.” For much the same reason, new products can have 10-15-year life cycles, so development has to be measured on this same time scale.

Janes asked each of the panelists how they structured their organizations with respect to R&D, i.e. how much work they do in house, how much they do with partners, and how partnership arrangements are struck.

Scott indicated that Precision Biologic conducts most of this activity using its own expert staff, but new work does not proceed unless the results have been requested by somebody in a prominent market, such as the Mayo Clinic or the Cleveland Clinic. “Where they’ve identified a problem, they like to work with us because we’re small and flexible.” Rather than trying to offer up major medical breakthroughs to the entire world, the company deals with specific problems or questions that such clients bring to them. “You have to go where the experts are, because that’s where you have the credibility and that’s where you have the learning.”

Rowe responded that Marport approaches R&D from every perspective, in-house and out, with or without partners, always with an eye on the best return for the effort. “Again, it’s that pursuit of best-in-class. You use whatever structure makes the most sense to get the most value.”

“It’s a matter of stimulating the culture within your organization, continually having your CFO looking for sources of funding well in advance of embarking on these projects, then finding business partners to drive up the final requirements for those projects.”

Jock English, President
and CEO, IntelliSys
Aviation Systems

By comparison, English observed, the R&D goals of IntelliSys might look rather modest. “What we’re trying to do is identify leading edge requirements that our clients or potential clients may have worldwide. The second and probably most difficult part of the research is to figure out how to build it.” A case in point: integration with the financial resolution capability introduced recently by the International Air Transport Association. “This was a huge project for us because we had to integrate with this worldwide communication network that is essentially responsible for dispersing all the funds for the purchase of an airline ticket.” Such research endeavours generally find a champion within the company to lead it, as well as partners with other companies that have a common interest in the matter. English did note that he has yet to find a university program that would complement these activities, although consultants do regularly weigh in.

When questions were opened up to the audience, Jeff Crelinsten asked about a disconnect between innovative enterprises and Canadian public sector organizations whose programs are intended to mitigate the risks associated with companies' R&D activity. More specifically, the terms of those programs may call for any funding to be spent in Canada, when members of the panel made it clear that their success has depended on finding the best people and partners anywhere in the world. “Is this an example where a cultural lag has come in, and the way of doing business in the policy world has been outstripped by the way the business world has evolved?”

Rowe agreed with that assessment, but acknowledged that the outlook of policymakers has changed. Nevertheless, he said his company often has to put in a higher level of equity into its R&D undertakings because much of the activity was not going to take place in Canada, but at their regional operation in France. “That’s just the way it is. That’s just where the expertise happened to be. While that was recognized, it was not funded to a large extent. So we had to pony up our own money.” That said, he added, his company has begun pursuing French organizations that support R&D, given the contribution the company is making to that country’s economy.

According to Rowe, a more significant cultural lag affects not fledgling firms — which are generally well supported — but those that achieve a certain size, which can face serious difficulty in finding sufficient funding for a risky venture. “One of the issues that we see is that as we get larger, the projects get bigger and more complicated. Are we prepared to continue to support funding for organizations to take bigger risks, take bigger profiles, or let them go out on their own.”

English echoed that view, noting that some 60 per cent of his company’s revenue comes from outside Canada, and many of the benefits associated with the work will likewise accrue outside the country. Precision Biologic faces much the same circumstances, said Scott, who nevertheless insisted on a rationale for Canadian support of this firm. “If the mind and management of the company is here, and if the commercialization result is going to benefit Canada, then there’s no reason why that shouldn’t be supported. You’re supporting the growth of a business here.”

Another questioner asked for more specifics about the relationship each company struck with partners in R&D initiatives and the eventual disposition or ownership of the emerging products. Scott suggested the relationships covered a wide range, from formal contracts to looser

Best in class on a global basis comes with overhead. I think it's worth it.
Derrick Rowe, Chairman,
Marport Deep Sea Technologies

friendships, as well as from straightforward remuneration to pro bono contributions made in order to participate in the research. In fact, many academic researchers are eager to get involved but insist on not being paid, as they will have to disclose such income as a potential conflict of interest.

Rowe confirmed that his company's dealings in this area were similarly varied. "One of the challenges is intellectual property management when you get into cross-border situations, multiple jurisdictions. It's a complicated world when you're doing R&D in foreign jurisdictions — from a tax perspective, from transfer pricing."

English pointed out that the relationships struck by IntelliSys tend to be defined by discrete products of one sort or another. Often they will carry out R&D work in house, then simply communicate the results to clients for them to apply as they see fit, rather than taking on the task of providing a larger level of service on a multi-national scale.

Jerry Bryne described the "elephant in the room" as being the province's Oil and Gas Manufacturing and Services Export Development Fund, which specifies that 0.6 per cent of the money made from every barrel of oil coming from Newfoundland and Labrador will be invested in R&D. He asked the panel how they regarded the impact of this significant infusion of cash in Atlantic Canada.

Rowe expressed his concern that there were no existing bureaucratic mechanisms for spending this money, especially when it comes to investing in risky ventures. He suggested it would eventually be disbursed, adding that while investments in municipal infrastructure or universities could be worthwhile, the money is intended to enable much more ambitious economic directives.

A questioner raised the difficulties surrounding the notorious "valley of death", the period of necessary R&D that must come before the results of that R&D begin generating revenue. English admitted the inherent difficulty in taking any kind of new idea to market, such as demonstrating that you have any ability to function in the market in the first place. Establishing that kind of track record can in itself be difficult, however, creating a chicken-and-egg conundrum.

When asked about the time frame for development to occur, Scott replied that five years was about average, although he qualified that observation by pointing out that changes in the pharmaceutical industry come quite slowly. Rowe said his own time frame was about the same, but that individual projects would be driven by what it takes to out-bid competitors for work; development essential stops once that threshold has been reached, rather than continuously improving products or services to no discernable advantage. "You need to be in front by several

years, and I look at the market as three to five years, and we look at getting return on our R&D within 24 months.” English added that IT innovation happens much more quickly, with returns on R&D ideally coming within a year in order to be worthwhile.

Paul Dubé, from the Newfoundland and Labrador Association of Technology Industries, asked about the role of public agencies as early adopters or first customers for an innovation. In a related vein, he also asked about how to cope with the constriction of working capital for R&D during the current economic downturn.

Scott explained how the successful launch of Precision Biologic products hinges on a positive response from credible opinion leaders, wherever they might be found, not just the public sector. Nor has the support for this work been affected by any economic turbulence. Likewise for English, the early adopters tend to be those visionary clients who can take advantage of new products. This can be especially useful when a client in some other parts of the world finds applications or value in such products that makes them easier to sell to clients closer to home.

Rowe complained of a policy-based administrative reluctance to adopt new technology within provincial or federal government agencies. “Our system is not built to do that. It’s built to take risk out of the procurement side. There is no strategic procurement, period.” Changing this situation means convincing policymakers of the value of early adoption, a significant undertaking to approach key people within various government departments.

With respect to reduction in the amount of working capital for R&D, Rowe returned to his earlier comment about the inability to scale up support for promising ventures. He argued that the funding mechanisms that are in place all aim for companies worth less than \$10 million. And if the policies supporting that kind of limitation do not change, he concluded, we should not be surprised when companies leave Canada after achieving a certain size.

A questioner noted that the industrial products being described by the panel members would have a very different ratio of marketing to R&D than an array of consumer products. More specifically, he asked how they supported investment in marketing if that was not specifically supported by funding agencies.

Scott noted that the marketing of their products was generally incorporated into the R&D phase, since the same organizations taking part in this work are the ones who will become clients afterward. Nor do clients like hospitals compete with one another, so they refer products directly without the need for Precision Biologic to promote it. English indicated that the airline industry was a similarly small and tightly knit community, with word of mouth serving as the usual form of marketing.

In contrast, Rowe said he did have to spend a considerable amount of the company’s own money on marketing. Here again he pointed to this as another factor related to the size of the enterprise, although the proportion that must be invested in marketing his company’s industrial products is nothing like that of a typical consumer commodity.

Ron Freedman asked panel members to comment on the role of universities or colleges as a source of new ideas. Scott replied that his organization recruits directly from universities, but even in places where the necessary technical background exists, it can take as long as a year to integrate that expertise into their business. Rowe painted a similar picture, while wondering how local institutions such as Memorial University or the NRC Institute for Ocean Technology had not evolved to become even more significant hubs of R&D activity in key sectors. English indicated that IntelliSys continues to derive the greatest advantage from working with clients, and had yet to find a university-based program that could further their business in the same way.

Janes summarized by asking the panel what elements might be missing from Atlantic Canada's approach to R&D. Rowe reiterated the need for funding to larger projects. "The structure of what we have is great. I think we stop, just when we're getting successful. That is capping our ability to do better."

Featured Keynote: Atlantic Canada's More Innovative Economy — A Work in Progress
Paul Mills, Vice President, Atlantic Canada Opportunities Agency

As much as he welcomed the economic stimulus money to address infrastructure needs in the region, Mills insisted that his paramount concern was with longstanding Canadian shortcomings in R&D performance, as well as related issues of productivity and competitiveness. He therefore proposed telling a story about innovation in Atlantic Canada, as seen through the eyes of ACOA, the collective accomplishments of the region as well its persistent obstacles, and some public policy questions that the organization continues to face.

Beginning with a snapshot of the region a decade ago, he recalled its slowly diversifying economy, a small industrial base, a reliance on primary resource extraction highlighted by offshore oil and gas production, academic institutions dedicated to research excellence, a small population, and a relatively isolated market. This was also the time when the value of a knowledge economy was becoming apparent, with R&D being vital to long term prosperity and competitiveness. This included strengthening private sector R&D activities, enhancing the skills, awareness, and capacity of companies if they were to become fully invested in the business of innovation. A fair amount of funding was available for this purpose, but he acknowledged that it required negotiating a bureaucratic maze to find it. Some did, but many more did not.

"The provinces have really got their act together. Each has identified research and innovation as a cornerstone for economic planning."

Paul Mills, Vice President,
Atlantic Canada
Opportunities Agency

At the same time, the region had a below-average uptake of funding from national bodies such as the Canada Foundation for Innovation or Technology Partnerships Canada. In spite of maintaining some solid building blocks — such as talented people and dedicated institutions — the region's spending on R&D as a percentage of Gross Domestic Product was just over half of

the national level (1.15 per cent in Atlantic Canada, versus 1.9 per cent for Canada as a whole). Even more revealing was the fact that fully 60 per cent of this spending came from business at the national level, while in Atlantic Canada this component was just 20 per cent. “This tells us that universities and government were the people doing the heavy lifting on R&D in the region.” More critically, though, even Canada’s overall output in this area ranks quite low by international standards, placing consistently below the OECD average in every respect. “This is not a pretty picture. Canada has not done well with private sector R&D expenditures, and historically Atlantic Canada has performed poorly compared to the rest of Canada.”

Mills explained that this picture changed dramatically between 2002 and 2007. Just as the national business expenditures on R&D were dropping 10 per cent, in Atlantic Canada they went up. Today, the gap between national and regional spending in this area is smaller than it has ever been. So what happened?

He credited some of the shift to a maturing of the relationships between industry and academic research institutions. Their mutual confidence and awareness has increased, overcoming at least some of the barriers that existed between them. At the same time, the four Atlantic provinces are increasing their respective investments in innovation systems. “And we’ve got an extremely positive development here in Newfoundland, where the provincial government has launched an R&D corporation with a broad policy mandate and a comprehensive programming suite.”

Mills added that the federal government, for its part, has been working steadily in the background while all this progress has been made. Spearheading these efforts was the Atlantic Investment Partnership (AIP) Atlantic Innovation Fund (AIF), launched in 2000, a \$700 million initiative intended to be a strategic catalyst for the region’s economy. The AIP addressed the local shortfall in research and innovation activity in comparison with other parts of the country, which likewise compromised Atlantic Canada’s ability to attract money from federal programs. Drawing exclusively on the region’s institutions and resources, the plan fostered partnerships between academia and the private sector, focusing on commercialization potential of its output. “Our experience has shown that the AIP has certainly been in very high demand. It has addressed some of the shortcomings in our innovation capacity. And it has shown measurable success.” Because of its success, the program was renewed in 2005.

He recounted how NRC played a key role in that success. They used AIP funding to develop research clusters in each province, building up science and technology-based innovation capacity in areas of local or regional strength. In PEI, that strength was bioscience; in Nova Scotia, it was life science and marine bioscience; in New Brunswick, it was IT and e-business; and in Newfoundland and Labrador, it was ocean technology. “The NRC is in a unique position here. It has a qualified, highly skilled pool of local researchers and resources.” These clusters also built on collaboration between industry, academia, and all levels of government. Mills offered OceansAdvance as an outstanding local example of the result, a multi-stakeholder, regional technology cluster dedicated to making St. John’s an international location of choice for ocean technology.

At the level of local partners, Statistics Canada, and the OECD, he said, the Atlantic Innovation Fund has been recognized as a considerable catalyst for such developments. Over the course of two rounds, the AIF has disbursed some \$600 million. “It’s encouraged researchers and research institutions to consider commercial applications for their work. It’s provided the financial incentive for private sector companies to seek out researchers on university and college campuses.” He regarded as revealing the observation that the initial round drew only 31 per cent of its projects from the private sector, while the second round saw fully 58 per cent led by this group, and other applicants featured private sector components.

Nevertheless, recalling Derrick Rowe’s comments about the need to fund larger undertakings, he noted that project funding through AIF was capped at \$3 million in order to cope with the significant demand.

So, are we there yet, he asked. Mills gave the short answer as no, in spite of these gains. “We’re not yet fully realizing the economic benefit stream from these projects that we anticipated. We’re not seeing the robust commercialization outcomes that we had all hoped for.” He conceded that it was hard to say why this is so, except that it can take a long time to see such outcomes. This led him into the second part of his talk, the remaining hurdles facing the region. He distinguished four areas: alignment of government resources, people, access to capital, and collaboration.

With respect to alignment, he identified problems associated with the same programs that have so successfully facilitated growth. “Alignment, as a concept, is a very difficult thing to get right,” he said, noting that the number of agencies taking part in these processes has multiplied dramatically over the last few years. “We still have some work to do on getting all this stuff to work together in an integrated, seamless way.”

“Companies need a complete, competent, and experienced team. They need a person with the skills to form international alliances and seal distribution deals, with market knowledge and access. They need a person who can walk into a meeting of venture capitalists and walk out with their confidence and their money. They need a fully functioning board of directors.”

Paul Mills, Vice President,
Atlantic Canada
Opportunities Agency

With respect to people, he identified the need to attract and retain the most highly qualified people in the region’s enterprises. Just as important as finding these people, he explained, is getting the right mix of them. The need goes well beyond just installing more and more employees with Ph.Ds. All of this variety of talent is essential to taking innovation not just from the laboratory to the production line, but ultimately to the bank. “We’re at a significant disadvantage in this region because we’re still in the first generation of R&D companies. We do not have a previous generation of wise old men and women who have already achieved success, to sit on everyone else’s board. The difference between success and failure — more than brilliant innovation, more than market readiness — is the strength of the management team and the confidence they can inspire in potential

investors. That makes all the difference in closing a deal.” By way of addressing this problem,

ACOA has set aside several million dollars in AIF for a commercialization, consulting, and mentoring program. “It’s our little version of finishing school.”

With respect to access to capital, Mills said the interpretation of different forms of “capital” can vary from one context to another. He insisted, however, that funding from government sources can never fully compensate for a shortage of venture capital from private sources. A better approach would be to make companies more attractive to such capital. “It’s more of a demand-side problem than a supply-side problem.”

Specifying that he was expressing only his own opinion, he harkened back to the issue raised by the first panel discussion surrounding strategic procurement by public sector agencies. “This is where this country is missing the boat, compared with other jurisdictions. It’s a very smart form of capital. Government procurement contracts for R&D are one of the most powerful forms of capital that a small technology firm can receive.” He listed several advantages: ongoing income to sustain the business, collaboration with government agency experts, and the vital reference of a first sale needed to secure future sales. “This issue is especially relevant here in Newfoundland and Labrador, because we produce so many products and services where government should be the major customer and collaborator in the development process.”

Finally, with respect to collaboration, he held up organizations like OceansAdvance and PEI BioAlliance as good examples of intermediary agencies that work effectively in the heart of a local innovation system. That said, clusters in Atlantic Canada are still not mature enough to compete on a national basis. In the latest round of competition for funding from the National Centres of Excellence program, for example, none of the recipients were from this region; indeed only one applicant got past the Letter of Intent stage. “So while \$163 million went to 11 centres to pursue major discoveries, we didn’t get a look in. That’s not a good sign, when the notion of dedicated cluster development was born in this region.”

Looking to the future, he observed that NRC funding for Atlantic Canada laboratories is expiring, as is ACOA’s capacity to sustain AIF and other technology initiatives. Moreover, efforts to renew such support have to be made during a major economic downturn. This led him to raise several questions about how to move forward. “Do we stay the course, the way we have these things set up right now?” he asked, again recalling Derrick Rowe’s complaint about the lack of support for firms that grow beyond a certain size. Other questions revolve around disbursing AIF support on the basis of specific sectors, as well as promoting projects intended to strengthen Atlantic Canada as a whole. Mills added that AIF had been expected to appeal to resource-based firms in areas like mining or lumber, seeking to improve their productivity and competitiveness. Yet few of them actually did apply, leading him to wonder if the program should be tailored to make it more attractive to this group.

David Shindler argued from the floor that federal support for clustering of R&D activity currently tends to favour exceptional large metropolitan centres; he therefore asked if the federal government was amenable to changing the structure of these funding arrangements to accommodate the needs of more sparsely populated places like Atlantic Canada. Mills replied

that any such change would emerge only from the efforts of people in Atlantic Canada, making an attractive case to people in Ottawa about why and how those needs should be met. “They’ve got to learn that we need a model that embraces the full diversity of what we have in Canada in terms of regional institution and sectors that matter.”

Panel 2: Building an Applied Research Infrastructure

Panelist: David Finn, President, Petroleum Research Atlantic Canada (PRAC)

Panelist: Marli MacNeil, CEO, BioNOVA

Panelist: Leslie O’Reilly, Executive Director, OceansAdvance

Moderator: David Shindler, Executive Director, Springboard Atlantic

Shindler began by describing one of the conference’s recurring themes as that of access to new opportunities and new technologies, like that found within Springboard’s college and university membership. “We have terrific collaborative possibilities, but we still have to have the resources and the management to make this work.”

He qualified those remarks by pointing out that universities are not natural applied research infrastructures. “We’ve grafted that capability onto it by selecting individual professors and individual parts of the university that have that capacity. We have to look at alternatives and we have some unique opportunities to build that capacity if we can compare it with other places in Canada that have built it.” In that context, he asked the panelists to introduce themselves and offer some insight into how their respective organizations frame goals for research and business capability.

“All our focus in terms of growing spending is on joint industry projects and programs that are linked to clear deliverables, that see collaboration between private sector suppliers and the research community at large.”

David Finn, President,
Petroleum Research
Atlantic Canada

Finn recounted that PRAC began as the Atlantic Canada Petroleum Institute in 1999, but has spent just \$6 million on R&D in the ensuing decade, a relatively modest amount that reflects the industry attitude toward these kinds of activities. He described PRAC’s formal mandate as enabling the safe and environmentally sound development of the region’s petroleum resources, while its unofficial mandate is helping industry members meet their R&D obligations. Historically, he noted, R&D spending in this industry has been low, but this amount has doubled in the last two years. More specifically, then, PRAC is attempting to change the nature of this investment, which has traditionally gone toward university research. As recently as 2004, for example, only five per cent of the total went to private sector firms; last year, it was 63 per cent. “We expect to see bigger projects that are more linked to direct industry needs within the next few months.”

MacNeil introduced BioNOVA as an industry-led consortium of Nova Scotia life science companies, which is now 20 years old. With no funds of their own to invest in research, they work on behalf of industry members who make such investments. In fact, some 65 per cent of the

amount invested in R&D in this field comes from these private sector participants. Moreover, these investments take place wherever the best and brightest are to be found, whether that is in Canada or elsewhere.

OceansAdvance, which was established in 2005, built on an emerging critical mass of regionally based expertise and institutions dedicated to marine technology, which has been building since the 1970s. O'Reilly described the job as helping this sector become better structured and promoting its prospects, which consisted of about \$250 million in revenue in 2005, which was growing at about 15 per cent per year. As much as 80-90 per cent of this revenue came from outside of Canada, and OceansAdvance is currently dedicated to helping the total reach \$1 billion in the next five years. O'Reilly identified the organization's key challenge as maintaining the industry's stock of intellectual capital, including investments in research programs and support for graduate students.

When asked about how members of BioNOVA can best broaden their research horizons, MacNeil said their driving motivation is market opportunities. "Research, whether it be applied or primary, has to take into account that at the end of the day there are companies that need to sell products to global markets." For these particular companies, more than 90 per cent of that market now lies outside of Canada, representing about \$250 million worth of export sales every year. BioNOVA is therefore establishing partnerships with various organizations to explore these possibilities, such as a program with hospitals to develop the next generation of medical technology. Nor is this a matter of getting involved with the existing research agenda of these organizations, but actually creating an original agenda for the members. In this respect, one of the greatest challenges has been the province's lack of an internationally recognized research institute, which is a limiting factor for attracting the interest of large pharmaceutical firms.

Shindler then asked about what changes would take place within PRAC as its pool of R&D funding begins to grow significantly. Finn foresaw a fundamental shift in the scale and scope of the projects that would be undertaken. As little as two years ago, funding was issued only after a call for proposals, which was capped at \$150,000 per project and further limited to \$50,000 per year, so that most of the work consisted of smaller, narrowly focused ventures. "We're looking for better projects. We do see bigger, more applied, more directed projects. Access to capital is not the issue. Our members have money to spend. But what we need to see more clearly defined in the kinds of proposals and programs that we get from proponents is better alignment, more business relevance." He identified weaknesses in the management of research programs or technology development, a skill set that he would like to enhance. "We'd like to see more collaboration from the research community and the government labs with the private sector suppliers."

"The issue of money is probably not the critical challenge. It's about how we can create very innovative, leading-edge thinking."

Leslie O'Reilly, Executive Director, OceansAdvance

Shindler asked the panelists how they would spend \$100 million to benefit their membership or sector. Finn pointed to a demand among PRAC members for tackling some of the industry's major problems, such as dealing with how ice holds back offshore

development. MacNeil said her industry does not face the same kind of large, overriding challenges, so a more likely goal for investing this money would be in finding ways of helping members increase their ability to bring products into the marketplace and make a greater contribution to the regional economy. “Having money to bring to the table would give us an opportunity to build that expertise that we may lack in some areas, and maybe grow some others to the point where we are internationally recognized.”

O’Reilly, for his part, noted that his organization’s strategic planning is considering some \$300 million worth of investment, so the \$100 million would be just a starting point. This planning would integrate people, research, and infrastructure, as well as creating as many as five or six themed research centres that would build on existing and desired strengths in the industry. In addition, there would be a number of similarly themed research programs, along with investment in graduate work and the retention of expertise in the industry. By way of underscoring this principle, he recalled Jerry Byrne’s remark about the virtue of farming over hunting. “That was a very critical remark that does tell you something about deepening the culture. We’re looking at models that bring our people to work much closer together. We believe if we can strengthen our research base here, then we will be an major attraction on the ocean tech side and certainly for international research institutions and other companies.”

“We develop very good employees in our institutions, whether it’s universities or community colleges, but we’re not necessarily graduating entrepreneurs, and so we’re looking at how we can both work with these institutions not just to get highly qualified personnel to work with industry now, but how to get the next generation of industry owners out.”

Marli MacNeil, CEO,
BioNOVA

When asked about the links with post-secondary education, O’Reilly maintained that the approach he described should strengthen existing relationships by creating opportunities for students to work in industry as well as industry personnel to take academic secondments. MacNeil said similar links were being built through her organization, such as a biomedical engineering initiative that enables students to work with clinicians and other members of industry. “So at the end of the day they’re not just ready to work in industry, maybe they’re going to be ready to start a company.”

Finn replied that each engineer who goes into graduate school represents one less potential employee who is available to industry. O’Reilly picked up on that point, noting that students are even reluctant to get involved in helping to found new enterprises. “Yet if you go back three or four years ago, the growth of this sector was a combination of people who started companies coming out of other organizations and also some new company development. We believe that to continue growth and stimulate innovation, we’ve got to focus activities on new company development as well.”

When asked by Derrick Rowe how PRAC is funded, Finn explained that the organization has a membership fee based on their production and exploration volume. He added that joint industry projects, which call for investment by interested participants, represent the bulk of the new

revenue over the last two years. When pressed, Finn admitted that the total amount of this increase was still only around the \$1 million mark, leading Rowe to ask about the potential for much more ambitious and expensive undertakings. “Are you up for \$10 million proposals?”, he asked, leading Finn to offer the example of an emergency response and evacuation project worth some \$20 million. Finn noted that the organization’s earlier work consisted of near-term, limited research, such as improving the design of problematic valves, but such work should soon be eclipsed by far larger collaborations.

O’Reilly emphasized the need for the members of the industrial sector to step up to take advantage of the opportunity presented by the new R&D funds that will become available. “It’s not enough for us to keep looking for projects to come in and do a little bit. Our expectations have got to change in the community toward these R&D funds. We’ve got to set an agenda that is going to be a building block, and build, build, build.”

When asked by a representative from a small company that provides a variety of marine services, Finn confirmed that this company could submit a request to PRAC in order to obtain support for their research services. Shindler commented that such a contractual arrangement was highly limited, in contrast to work that might build up a self-sustaining research capacity with long-term goals.

Panel 3: Entrepreneurship and Business Building

Panelist: Marcel Gervais, President, DDx Health Strategies Inc.

Panelist: Stephen Hartlen, VP, Mentoring, InNOVAcorp

Panelist: Nancy Mathis, Founding Executive Director, G. Wallace F. McCain Institute for Business Leadership, UNB

Moderator: Douglas Robertson, Director of Innovation Policy and Research Projects, Atlantic Canada Opportunities Agency

“I believe very strongly that entrepreneurs are born, and then the school system breaks them.”
Nancy Mathis, Founding Executive Director, G. Wallace F. McCain Institute for Business Leadership | INR

Robertson began with a classic quote from George Bernard Shaw: “Some look at things that are, and ask ‘why?’ I dream of things that never were and ask ‘why not?’” He then cited economist Joseph Schumpeter’s observation that entrepreneurs blow gales of “creative destruction”. He finally asked the panelists to confront the venerable question of whether entrepreneurs are born, or can this talent be learned.

Mathis was adamant: The way in which we acquire simple physical and mental skills reflects the fact that we are all born entrepreneurs after a fashion. “If we weren’t entrepreneurial at birth, we would never learn to walk. Someone encourages us at that stage to try and risk and then get up and try again. And it’s through those successive failures that eventually we make our way through to walking. Sometime between that age and when we’re six or seven we’re told to sit down, colour inside the lines, grass is green, stay in your seat, don’t take control of the

classroom, and don't take control of a microphone.”

Gervais, speaking as an entrepreneur who regards himself as having learned such skills throughout his career, nevertheless expressed his agreement with the notion that we are all entrepreneurial from the start. Growing up in a highly structured military family, he recalls trying to find work that was similarly organized, only to find himself demanding more than the workplace could offer. Referring to the acronym ASK — “Always Seek Knowledge” — he explained how he regularly imposes Shaw's dictum on his staff, forbidding them from using the word “can't” when dealing with any problem or challenge.

“Students need to see a pathway, how to get to those positions where they could actually start their own companies.”

Stephen Hartlen, VP,
Mentoring, InNOVAcorp

Hartlen also concurred, adding that many people are entrepreneurial in nature and do not realize it. He noted that quality often comes to the surface after you work with them for a while. Mathis built on this point, distinguishing between the term “entrepreneur” — which summons up the image of an independent business operator — and “entrepreneurial”, a feature that can be applied to any kind of creative undertaking in a working context. “You can be entrepreneurial in your behaviour. You're looking to make things better

or for continuous improvement. Your tenacity in dealing with a boss. All those things are entrepreneurial attributes. If we can move to an entrepreneurial behaviour, then we're looking at characteristics, not a job title.”

Robertson recalled Leslie O'Reilly's comment on the lack of entrepreneurial ambitions being expressed by young engineers, which could be linked to the strengthening of the region's economy, which makes more traditional jobs available. In that light, he asked the panel about the overall significance of nurturing entrepreneurial skills, and how that might be done.

Hartlen suggested that he has seen little evidence of such skills being cultivated through the post-secondary education system. At the same time, he insisted on the need to point out successes in the community. His own firm supports business student competitions across Nova Scotia, a way for students to experience this process for themselves, as well as introducing them to successful entrepreneurs.

Mathis maintained that the crucial element is recognizing and encouraging an entrepreneurial spark as early as possible. Even before she was a teenager, she said, a mentor counseled her on becoming an engineer, based on how she had re-arranged furniture in a Sunday School classroom. She envisioned a way of formalizing this process, scouting such talent in much the same way that athletes are identified and recruited. The McCain Institute for Business Leadership has made progress in this respect with its “mentor bank”, which calls for participants to give as well as receive such invaluable amounts of share time and insights.

Gervais added that this process could start even earlier, perhaps even in elementary school.

Young people are open to understanding the difference between making money within the bureaucratic confines in a typical fast-food job or the comparative freedom setting your own pace through an enterprise such as cutting lawns. “You’ve got to nurture that at that age, and make them realize that it’s not all about everybody working for somebody else. It could be a good thing, you can learn, but they can understand that there’s more to life and you can be in control of your own destiny.”

When asked about the role of mentoring in the technology sector, Hartlen said this practice reflects the extent to which the quality of people can trump the calibre of any product or service. “It’s never the question of whether or not the technology is unique, whether or not there’s some value in it in the marketplace. The question is really about the team that comes in with the technology.” When start-up companies encounter a gap in obtaining capital, he noted, the problem usually does not stem from any actual lack of available capital, but the absence of an appropriate team to merit that capital. His company therefore helps such firms address shortcomings in such teams, with an eye toward helping them become more viable, especially since most of them are in the notorious “valley of death” where they have yet to see any revenue from the products they are developing. “If you can shorten the time period that it’s going to take for them to go from where they are today to becoming revenue-neutral, that is a huge accomplishment.”

“If I can’t explain to my mentors, if I can’t sell them on where I’m going or what new product I want to introduce, how the hell can I expect to do it to people who are going to financially support us and more importantly, the customers?”
Marcel Gervais,
President, DDx Health
Strategies Inc.

Gervais suggested that mentors fulfill the extremely important function of reining in the zeal of people who are too close to the core of some activity, and liable to make mistakes because they are so eager to get on with it.

That function is becoming better appreciated by entrepreneurs working with Hartlen’s group. When these clients have been asked about the most valuable service provided to them, he said the traditional answer has been “venture capital”. Now, however, mentoring has taken precedence in this poll, with venture capital being cited in distant second place. “That’s a huge testament to how valuable this can be for a new company.”

In her own polls of entrepreneurs, Mathis noted that about a third have mentors, but far fewer confirm that they have adequate access to their mentors. By way of addressing this challenge, the McCain Institute co-ordinates peer mentoring, bringing together a diverse group of high-growth entrepreneurs whose businesses are all at similar stages of development, each capable of making a unique and lasting contribution to the others. Gervais recounted how his organization has applied this same model, to the same good effect.

Robertson asked the panel to consider how entrepreneurs should address challenges around financing. Hartlen reiterated his earlier suggestion that capital is available, and business opportunities do in fact get funded. “The challenge that we have in the region is not that the right

business opportunities won't get funded. It's that they don't get funded to the tune that they should get funded." The contrast in levels of funding for comparable start-ups in the Atlantic region versus California, for example, may be as much as a full order of magnitude. It is possible to compensate for this shortfall, he said, but it is a lot of work. Likewise recalling his remarks about the need to assemble a good team, there may not always be enough of the very best people to go around. Attracting those people to the region has therefore become a high priority, since their success will feed the success of others, as well as offering an inspirational model for students. Above all, he bemoaned the stigma Canadians attach to failed entrepreneurs. "There's VCs in California that won't invest in anybody until they've failed twice. That's their motto: show me what you've done before; show me how you've failed, show me what you've learned. Now I'm ready to put money in."

Mathis suggested that financing and mentoring could be tackled together by means of a tool that would offer some of the key insights from mentors in the form of a template, helping start-up firms deal with some of the most serious problems facing them. She cited another advantage from legislative initiatives such as New Brunswick's Small Business Investor Tax Credit, which was modified last year. Opportunities that might have once appealed only to ambitious angel financiers, she explained, are now open to a wider range of investors, who can retrieve a 30 per cent tax credit. Moreover, the cap on this credit has progressed from \$50,000 to \$80,000 and now \$250,000, which is the highest in Canada.

She also cautions against a business culture of "grantpreneurship", steeped too deeply in ability to obtain funding from public sector agencies like ACOA, which are mandated to improve overall economic development. Instead, investors want to see evidence of commercial potential, which can be demonstrated with feedback from existing customers. Gervais agreed, noting that while his firm has benefited from the support of organizations such as ACOA, even more success has followed from adapting the resulting products and services to meet the needs of the clientele.

Hartlen, for his part, indicated that he reminds his clients that ACOA money represents debt, so it is important to ask for the right amount of money, not the greatest amount of money. "Take the money, make sure you use it wisely, only ask for as much as you absolutely need, and use it efficiently."

Before opening the floor for questions, Robertson referred to recent findings that point to the effects that occur when entrepreneurs are overwhelmed by the day-to-day operations of their businesses, working exclusively *in* that business, rather than more strategically *on* their business. With a huge proportion of business owners preparing to retire in the next decade, they have engaged in little succession planning. In that context, then, he asked each panelist to pose three leading priorities facing business in this context. Mathis stated that her leading priority would be

"If you can create success, then you'll begin to change the culture, and those students coming out of school, and the general business community, will see that whether you succeed or fail, there's still an opportunity for you in a start-up company."

Stephen Hartlen, VP,
Mentoring. InNOVAcorp

to stop breaking our kids in schools, instead finding ways of nurturing the creativity of children, as well as helping everyone to learn to listen and learn to act.

For Hartlen, the biggest challenge facing companies in Atlantic Canada consists of finding people with the expertise to take products to market. A related priority is that of linking up the region's business community with its counterparts elsewhere. Likewise, he endorsed the value of coaching and mentoring in forms that are most appropriate to a particular business, although he expressed a distaste for simply bringing in expensive consultants to offer advice that may not reflect anything an entrepreneur wants.

Gervais took the perspective of his own company, where one of the greatest challenges has been bringing in people with an entrepreneurial flair to take over the day-to-day business and change management. Although this operation remains small, it nevertheless features a position called "employee development", acting on a plan to find and cultivate this kind of talent. "That's going to allow us to hand off and grow the business from a bigger perspective." This is also allowing him to build strategic alliances with other companies, taking advantage of their expertise to enhance the value-added to their customers.

Michael Scott pointed out that companies reach key junctures that raise important questions of future direction, and more specifically, managerial succession. Mathis offered the example of Sunny Corner enterprises, a \$100 million firm that employs about 700 people in New Brunswick, whose latest president is participating in her program for high growth entrepreneurs. The firm offers up-and-coming executives the ability to buy shares in the company, which they can exercise or the company can buy them out after a set period of performance. Gervais endorsed this approach as one that he would apply in the case of his own business, allowing him to introduce people who demonstrate that they share and are able and willing to carry on the firm's work in the same way. "It's a test run. You're going to get a good close-up view and you're really going to know if this person has the values and the vision that you had, and will continue that."

David King, President of Memorial University's Genesis Group for technology and industrial development, commented that the real value of teaching entrepreneurship is to instill that kind of thinking in people who may be on their way to becoming lawyers or accountants, yet who would benefit immensely from this kind of outlook. "If they can think entrepreneurially, and work with entrepreneurs, it'll change the whole culture altogether." Mathis outlined a new project at her university, a series of case studies drafted by MBA students, profiling the region's most outstanding entrepreneurs.

Closing Keynote: Lessons in Success for International Innovation

Noel Botha, Founder and Partner, Orion Innovations, U.K.

Botha defined innovation as a spectrum of activities that ranges from idea generation to exploitation, either for social good, commercial gain, or both. He also defined a national innovation system as the network of public and private sector institutions whose activities and interactions result in innovative outcomes. Innovation policies, then, were characterized as

typically government interventions aimed at ensuring the effective operation of this system.

He related that his organization was asked to help the Research and Development Corporation of Newfoundland and Labrador contemplate its own strategy going forward. As part of that process, they looked at a number of other jurisdictions that might have lessons for the province, including Alberta and Quebec, as well as Finland, Norway, and Scotland. Each of these international comparisons was useful, because they represent smaller centres of population that nevertheless score highly on measures of innovation. The results therefore informed much of his presentation.

The leading characteristic, according to Botha, was a single, integrated innovation policy that was effectively communicated and implemented across government, industry, and academia. “There was a common understanding as to where people were headed, and why.” In addition, he added, such innovation policies were driven by social or market need.

Successful systems were also characterized by simple structures with clear ownership and responsibilities for delivering innovation policy. The findings also revealed the virtues of separating the development of policy from its delivery. Likewise, it would seem to be obvious that innovation should be highly valued by government, academia, and business, but some systems did a better job of assigning that value, which made those systems perform notably better.

Finally, the most effective systems included multiple mechanisms for ensuring ongoing collaborations throughout the entire system. By way of example, he offered Finland, a country founded on a primarily agrarian foundation, which remained an extractive, resource-based economy until the 1980s. At that point, Finland took a formal decision to stop supporting its mature industries and cultivate industries of the future. That prospect was complicated by an economic downturn in the early 1990s, brought on by the collapse of the Soviet Union, which had been the major market. Nevertheless, the economy bounced back quickly, and over the course of about 30 years has been transformed into a technology-based economy, centred on communication technology.

“Every innovation system we looked at had slightly different governance and structure, and these reflected the history, the environment, and the objectives of that particular system. However, there were a number of very common characteristics across the more successful jurisdictions.”

Noel Botha, Founder and Partner. Orion Innovations. U.K.

Finland was one of the first countries in the world to adopt the concept of an innovation system, and it has kept that system simple, making it the basis for the country’s science and technology policy. Botha described the system as having four levels: Parliament, in charge of overall direction; government ministries, which interpret policy according to their respective mandates; specific innovation agencies that deploy policies; and finally, organizations that actually conduct R&D work, such as businesses, public sector or not-for-profit agencies, and

academic institutions. More specifically, Finland maintains a science and technology policy

council. Made up of members from throughout the system — such as representatives of key ministries, from business, trade associations, and academia — this council provides the government with regular input to keep its innovation strategy up to date.

Botha detailed five aspects of successful innovation policy: expenditure on innovation has to be significant in order to be effective; a focus on key industries, technology or sectors that are especially important in this region, offering a competitive advantage; a balance between technology push and market pull models of support; seamless integration of interventions across the innovation chain; an emphasis on internationalization.

With respect to expenditure, he displayed figures showing that as innovation systems mature and the overall level of spending rises, so too does the proportion of private sector spending. In Finland, for instance, that proportion is upward of 70 per cent. He speculated that there are benefits to having a larger population and making comparable large scale investments in this context. “It’s not as essential to get everything right if you’re big.” That said, funding alone does not necessarily guarantee success, as he found in places like Quebec. “Quebec in Canada is an example that seemed to be spending much more than the Canadian average on research and development but we didn’t necessarily see strong evidence of that delivering superior performance.”

With respect to focus, Botha offered the example of Norway, a country with a small population that has had to make specific choices about its structural, thematic, and technological priorities. For instance, the country has set four thematic priorities: energy and environment, oceans, food, and health, each chosen because of some social need or evidence of international excellence in this area. Similarly, technological priorities have been identified in fields such as communications, nanotechnology, or biotechnology. Each of these priorities can drive large-scale programs, funded for millions of dollars and lasting as long as 10 years.

With respect to technology push versus market pull, he contrasted two models of how innovation enters the marketplace. The former is premised on the idea that if you provide sufficient resources to researchers, they will develop ideas that have some social or commercial application. This does happen, but it is limited by the fact that most primary research is not undertaken with any kind of social or commercial goal in mind. In contrast, another way of looking at innovation is based on the assumption that when businesses are supported in research through grants or tax credits, they will develop products that have commercial value. In order to overcome the limitations of each model, collaborative research has been increasingly promoted in places like the UK. “It is being done through large-scale, sector-specific programs. This is where you’ve identified where your technology priorities are, and you have programs that are perhaps looking a decade or more out, which encompass everything from idea generation through to commercialization, and encompass both long- and short-term projects.”

With respect to the seamless integration of interventions across the innovation chain, this covers support for elements such as physical infrastructure, development of people and skills, or primary science. “All of those interventions exist in virtually every jurisdiction. What is interesting is that

in the more successful jurisdictions, there is a high degree of integration and collaboration across innovation agencies and government support bodies in order to ensure that there is a seamless integrated approach to this.”

Finally, with respect to international collaboration, Botha suggested that while this can be a contentious topic in many circles, it turns out to be especially important in smaller jurisdictions. Among other advantages, looking outside the country allows researchers to participate in projects where there is a critical mass of people and resources to achieve outstanding results, where there may have been no such critical mass at home. In much the same way, businesses can export local knowledge into larger markets, while exploiting international innovation capabilities. For just this reason, it is worthwhile for these smaller jurisdictions to support researchers and businesses operating at this international level, which should yield returns at the local level. In fact, even the public agencies that support innovation are themselves moving onto the international stage, opening offices in rapidly growing markets such as India or China.

Botha wrapped up by applying these principles to Newfoundland and Labrador. He noted that the nature of funding has created a bias toward primary research, and the predominance of smaller enterprises has limited the potential for significant market pull innovation efforts. “It is clear that there are sectors within the province with international expertise and critical mass,” he said, referring to his work in setting up the Research and Development Corporation. “What we weren’t seeing at the time we were here was that that was necessarily reflected in provincial innovation policy or even national innovation policy. Certainly not the high level of co-ordination that we’re seeing in places like Finland and Norway.”

Above all, he concluded, there remains a lingering challenge that relates to infrastructure and people. His final recommendations for Newfoundland and Labrador included establishing as simple an innovation system as possible with a high degree of coordination and collaboration, which should be much more feasible in a smaller setting like this one. Similarly, he endorsed clarity of ownership for the development and delivery of policy, and that such a policy should be clearly articulated, focusing on a limited number of key sectors. In addition to balancing technology push and market pull models, he encouraged tax breaks enabling businesses to invest in R&D. “Do focus on creating the seamless integration across the innovation chain. And last, but by no means least, include international collaboration in every aspect of what you do, from primary research to ultimate commercialization.”

“Clearly if you’re going to substantially increase the amount of research, development, and innovation in the province, it needs to be done somewhere, and it needs to be done by people with the relevant skills and experience.”

Noel Botha, Founder and Partner, Orion Innovations, U.K.

Douglas Robertson asked about the local innovation systems found in places like Finland, which complement the country’s strong national system. Botha acknowledged this reality, but he reiterated that these local efforts were facets of the single overriding system that gives such strength to innovation in Finland. In the UK, by contrast, he noted that there was a greater degree

of devolution at the local level, which can lead to some confusion. “One of the challenges is as soon as you’re seeking to address an issue that requires a national or international initiative, then tensions arise. Certainly within the UK, the regional development agencies within England, and even more so within England and the devolved administrations, they compete with one another. Competition is good in certain instances, but not in others.”

Rob Greenwood, of Memorial University’s research and policy centre, the Harris Centre, asked about three significant contrasts between the Nordic countries, the UK, and the Atlantic provinces, namely political structure, political culture, and scale. Botha regarded such contrasts as typical of international comparisons, which necessarily reflect the vagaries of each local context. “Every innovation system we looked at is different, and reflects its particular socioeconomic, political environment, history, and objectives. I don’t think there is any merit in lifting wholesale any model from another country. It really is a matter of taking the lessons that we can from another country and making them relevant to your own jurisdiction.” He added that

the present moment, buoyed by growing revenues from the energy sector, offers unprecedented opportunities to enhance R&D within the province.

“To think that this is a part of a country that is having self-confidence about entrepreneurship is really surprising to me. This should be the most entrepreneurial part of the country.”
Ron Freedman, Co-publisher,
RESEARCH Money

Conference Close
Ron Freedman, Co-publisher, RESEARCH Money

Speaking as someone who has travelled to Atlantic Canada over the course of the last 25 years, Freedman noted how dramatically the fortunes of the region have evolved. By way of example, he recalled that his first collaboration was with the University of Prince Edward Island, an institution that at that time was prohibited by legislation from offering graduate education. “Think from today’s perspective of what a drain that was on knowledge creation, knowledge translation, commercialization in Prince Edward Island.”

And despite some of the frustrations voiced by Paul Mills, regarding the fragmentation and coordination within the region, Freedman maintained that at least these complaints represent progress. “In some ways it’s a sign of maturity and development. At least we’re having those problems that we didn’t even have before.” Nevertheless, it is essential that such problems be addressed, since this confusion is off-putting to the ambitious entrepreneurs who are expected to move the local economy forward.

In fact, there is a longstanding tradition of political and economic entrepreneurship in this part of Canada, from the initial forays of the Vikings a thousand years ago to the more recent activities of Lord Beaverbrook, K.C. Irving, Wallace McCain, Joey Smallwood, not to mention legions of self-employed loggers and fishermen.

Remarking on discussions about “industries of the future”, Freedman cautioned that the reality is that most people make their living from industries of the past. “The real challenge, for all parts of Canada, is not necessarily to change what they’re doing and become industries of the future. It’s simply to become the best in the world at what they’re already doing. It doesn’t matter what you do. If you become the best in the world at what you do, you will always have a job.”

Unfortunately, Canada’s healthy endowment of natural resources has made it comparatively easy to earn a living without competing with those who have in fact become the best in the world at what they do.

Even something as seemingly low-tech as growing potatoes, he explained, can evoke this ambition. The superior quality of Prince Edward Island potatoes emerges from serious work into all parts of the value chain for this commodity, from laboratory work on the genetics and virology of the plants to the transportation and marketing of the final product. And sure enough, on a recent trip to Mexico, Freedman saw someone on the street carrying a box of McCain’s frozen french fries.

Freedman touched also on discussions of how much countries spend on R&D as a proportion of their GDP, figures that can mesmerize many observers. What is more important, he argued, is whether the industries in your economy are as productive as their competitors in other parts of the world. Similarly, a great deal of the discussion surrounding innovation focuses narrowly on innovation in science and technology, which are dealing mainly with the production of goods. But in fact, the added value of the contemporary economy is less dependent on the production of material goods, and the larger, growing part of the economy consists of services. The Western world’s future, he concluded, does not necessarily lie in making things, but in providing services associated with those things. An iPod, for instance, may represent \$4 worth of manufactured goods from China, and upward of \$400 worth of services provided by Apple in North America. “So let’s not get carried away by this notion of manufacturing things, if we can leverage those things into value-added services that we can use to earn our way into the world of the future.”

Biographies

Noel Botha
Founder & Partner, Orion Innovations

Noel is an innovative and highly experienced international consultant, with a track record of success in new business start, business turn-around and value-creating growth. He has worked extensively with public sector clients in the development of strategic plans in support of the delivery of innovation management, and has particular expertise in the renewables, energy, environment and process industries. Noel has developed a good understanding of the Canadian landscape for public sector innovation support

“So, if you’re the best in the world at what you do, you can make a buck selling potatoes in Mexico, not just selling potatoes locally.”

Ron Freedman, Co-publisher,
RESEARCH Money

through recent association with the Newfoundland and Labrador Research and Development Council. Noel is a Founding Partner of Orion Innovations LLP, where he has acted as mentor, interim manager and consultant in order to successfully guide innovative new businesses through start-up and early stage development, and helped to turn-around and grow established businesses through business extension, new ventures creation, and acquisition. Prior to joining Orion Innovations, Noel spent three years in a Senior Management role in a new energy technology company (fuel cells). Noel was a member of the founding team and was responsible for business development and corporate management activities. Noel previously held senior positions in leading international consulting firms, A.T. Kearney, KPMG and Chem Systems. Noel holds a Bachelors degree in Chemical Engineering from Birmingham University, a Masters degree in Organisational Behaviour from Birkbeck College, University of London, and an MBA from the London Business School.

Jerry Byrne
President, DFB Group

Born and raised in Newfoundland, Jerry Byrne graduated from Memorial University of Newfoundland with a Bachelors Degree in Engineering. Jerry started well known SEA Systems in 1983 and has gained experience in establishing and building companies, both locally and internationally, from the ground up. Jerry Byrne's business life is extensive and includes: forming numerous joint ventures, sales and marketing agreements, manufacturing, distribution and agency agreements. As well, he carries critical international and local experience and has developed several LOI's and MOU's with the private sector, and foreign and domestic governments. A true entrepreneur, Jerry was a founder of several local companies such as Sea Systems and its affiliated companies, Glamox Canada Limited (now Mariteam Lighting) in Trepassey, Cantech Systems Limited, Navalco Canada Limited and put together the relocation plan for Star Heat Exchangers from British Columbia to Port aux Basques. He also established several successful companies in the United States where he lived for several years before returning to Newfoundland and Labrador in the summer of 2002. Today Jerry is the key player in business development for D.F. Barnes. He is a director of the St. John's Northwest Rotary Club and, a member of the Association of Professional Engineers and Geoscientists of Newfoundland and of course NOIA.

Jock English
President & CEO, InteliSys Aviation Systems

Jock English is currently President & CEO of InteliSys Aviation Systems, a New Brunswick based company that provides hosted management systems for airlines worldwide. Jock has over 30 years experience in commercial software systems with responsibilities ranging from development and implementation to marketing of mission critical software systems for large organizations. Jock currently manages an organization of 22 employees that implements and

manages operation of high availability systems for management of reservation sales as well as crew qualifications and assignment. Prior to joining IntelliSys, Jock held positions with two large international software firms where he was responsible for software product development, implementation as well as international marketing of software systems for national mapping databases including aeronautical mapping. Jock's primary focus during his career has been in matching software solutions to Client's requirements. Jock holds degrees in Mechanical Engineering and Geomatics Engineering and is also a registered Professional Engineer. Jock has held both U.S. and Canadian pilot's licenses and remains well connected with the Aviation Industry

David Finn
President, Petroleum Research Atlantic Canada

Dave is an engineer with 20 years experience in applied research, industry liaison, project management, consulting and business development. Dave graduated from Memorial University in 1988 with a Bachelor of Engineering specializing in Naval Architecture. Dave returned to graduate school at Memorial to study ice interaction with offshore structures, specifically the dynamic loading of fixed structures in ice. He completed his Masters in 1991 and was the recipient of Memorial's David Dunsiger Award for Excellence in Engineering Graduate Studies. Dave has worked in Houston, Ottawa and Newfoundland in the public and private sectors, small and large business, and his employers have included the National Research Council of Canada, ZeddComm, xwave, and Aliant Energy Services. In 2006, Dave became President of PRAC – Petroleum Research Atlantic Canada, a not-for-profit organization that funds and facilitates applied petroleum research on behalf of its members, which include all the east coast operators and producers. He is a member of the Society of Petroleum Engineers and the Society of Naval Architects and Marine Engineers.

Stephen Hartlen
Vice President, Mentoring, InNOVAcorp

Stephen Hartlen is vice president of mentoring at InNOVAcorp, an organization enabling innovative early stage Nova Scotia companies to accelerate commercialization of their technologies and increase competitiveness in export markets. Stephen leads InNOVAcorp's venture advisory team, which provides advice and guidance to early stage technology entrepreneurs. Mentoring is a critical layer to the traditional business incubation and investment activities, enriching the corporation's High Performance Incubation (HPi)TM business model. Stephen joined InNOVAcorp in the spring of 2003 with more than 14 years of private sector experience in business development, sales, and go-to-market strategy development in both the corporate financial services and the information and communications technology sectors. At InNOVAcorp, Stephen and his team are deeply engaged in the daily operations of several portfolio companies as part of the HPi business model. Stephen is involved in a formal advisory capacity with several clients, including EastMed Inc., where he is a member of the board of directors. He also serves on the review panel for the Springboard 2008 Fund Awards. Stephen is a graduate of Dalhousie University with a Bachelor of Commerce in Economics and Saint Mary's

University with a Master of Business Administration in Finance. He is also pursuing the designation of Chartered Director through the DeGroot School of Business at McMaster University and the Conference Board of Canada

Glenn Janes
CEO, Research and Development Corporation

Glenn Janes is the Chief Executive Officer of the Research & Development Corporation. He is responsible for providing direction, focus and planning in order to strengthen and improve research and development throughout the province. Mr. Janes is a Rhodes Scholar. He holds a Masters degree in Environmental Change and Management and a Masters degree in Business Administration, both from Oxford University. He completed a Bachelor of Science in Chemistry at Yale University. Most recently Mr. Janes was with Imperial Innovations Group plc in London, England, the UK's leading technology commercialization company. At Imperial Innovations, Mr. Janes was responsible for the development and management of the United Kingdom's first Recycling/Waste Minimization Technology Commercialization Centre. Mr. Janes has held a range of progressively senior positions with companies involved in research, development and technology commercialization processes, including Platina Finance, a London and Paris-based private equity fund manager. In Newfoundland and Labrador, he has worked with Mad Rock, a developer of safety emergency evacuation sea systems, Hi-Point Industries, Consilient Technologies and Genesis Organic Inc. He was born in Western Newfoundland and resides in St. John's.

Marli MacNeil
CEO, BioNova

Marli MacNeil has been the Chief Executive Officer of BioNova - The Nova Scotia Biotechnology and Life Sciences Industry Association for the past seven years. BioNova represents the more than 3,400 men and women working in the province's life sciences community; its members include life sciences companies, universities, hospitals, research institutions, government agencies, suppliers, students and individuals who are committed to the vitality of the life sciences industry in Nova Scotia. Marli has degrees in Journalism and Political Science and holds the professional designation of Certified Association Executive (CAE). Prior to joining the staff of BioNova, she served as executive director of the Aquaculture Association of Nova Scotia. She also has extensive experience in community economic development and communications. With significant interest in the relationship between research and industry, Marli is currently a member of the Advisory Board of the National Research Council's Institutes for Marine Biosciences and Nutrisciences and Health, served on several aquaculture and fish veterinary research organizations and was an appointee to the National Advisory Council on Ocean Sciences.

Nancy Mathis
Founding Executive Director, G. Wallace F. McCain Institute for Business Leadership, UNB

Nancy Mathis, Ph.D., P.Eng. is the founding Executive Director of the G. Wallace F. McCain Institute for Business Leadership. This role combines her experiences as the co-founder and innovative force behind Mathis Instruments with her teaching background at the University of New Brunswick. Dr. Mathis has been recognized on a national scale with awards in innovation, entrepreneurship and engineering - as well as for supporting others in those fields. She has been an active member of the New Brunswick Business Council as well as a leading advocate for advancing pharmaceutical manufacturing practices. Dr. Mathis is the recipient of numerous awards and distinctions, notably the \$100,000 Principle Manning Innovation prize as the top innovation in Canada in 2003 (also won by the inventor of the BlackBerry) and the R&D 100 Award issued to the top 100 innovative products worldwide in 1999 (also won by the ATM, anti-lock brakes and Polaroid film)

Paul Mills

Vice President, Atlantic Canada Opportunities Agency

Paul Mills was appointed Vice-President of the Atlantic Canada Opportunities Agency (ACOA) for Newfoundland and Labrador, in January 1997. He joined ACOA in 1988 as Manager of the Ocean Industry Development Centre. Mr. Mills held other positions with the Agency, including Director General, Program Development and Delivery, and Director of Federal-Provincial Programs. A native of Newfoundland and Labrador, Mr. Mills has a Bachelor of Science degree and a Master's degree in Business Administration from Memorial University of Newfoundland. In 1999, Mr. Mills was the recipient of Memorial's Faculty of Business Administration's Alumni Honour Award. In addition to his role as Vice-President of ACOA, Mr. Mills is the Chair of the Newfoundland and Labrador Federal Council. Mr. Mills is also the Advocacy Champion for the Agency in the area of Science, R & D, and Commercialization.

Leslie O'Reilly

Executive Director, OceansAdvance

Mr. O'Reilly was appointed to the position of Executive Director of OceansAdvance in October, 2005. Prior to his appointment, Mr. O'Reilly served as Executive Director and Chief Executive Officer of the Fisheries and Marine Institute of Memorial University of Newfoundland since March 1992. He has extensive experience in various economic development, ocean sector alliances and Boards. Throughout his career he has focused on building collaborative networks and partnerships, provincially, nationally and internationally. He has been a member of the National Research Council (IRAP) Advisory Board and is past Director of the Newfoundland Ocean Industries Association. Oceans Advance is a multi-stakeholder, regional technology cluster initiative aimed at making St. John's an international location of choice for ocean technology. Driven by the private sector this ocean technology cluster is a partnership between business, research and development Institutions, academia and government. It has brought together key entrepreneurs, researchers, academia and government stakeholders from Newfoundland and Labrador and Canada's ocean technology community. OceansAdvance has been given a mandate to build research and development capacity and to enhance international

export and business opportunities.

Douglas Robertson

Director, Innovation Policy and Research Projects, Atlantic Canada Opportunities Agency

Douglas Robertson is the Director of Innovation Policy and Research Projects for the Atlantic Canada Opportunities Agency. Active in the innovation policy domain at the federal level for over 16 years, he has served on numerous regional and national innovation policy committees and reviews. His public policy career also includes ten years in Ottawa as a policy advisor and Executive Assistant to federal Cabinet Ministers and a senior policy analyst on Cabinet policy with ACOA. Robertson is a member of the Advisory Board of the Technopolicy Network, an international association of policy practitioners in science-based regional development. He is the founding Chair of the Moncton Technology Planning Group, a committee of local industry and institutional leaders focused on advancing a strategy to accelerate the growth of technology-based business and entrepreneurship in the Moncton area. From 2001 to 2008, Robertson was a member of the City Council of Moncton, serving as Chair of the Economic Affairs Committee of Council and on numerous Committees and Boards. Robertson received a bachelor of commerce degree from Dalhousie University in 1980 and a Masters of Business Administration from Saint Mary's University in 1986. He is active in a number of community organizations, including the YMCA Century Club, the PGI Tournament for Literacy, the Atlantic Ballet Theater of Canada Campaign Cabinet and the Athletic South East association. He is the proud father of three sons, Cameron, Christopher, and Wil. His wife Katherine is business development manager with Honda.

Derrick Rowe

Chairman, Marport Deep Sea Technologies

Derrick Rowe has led corporate operations that span the globe, and has extensive experience with business in highly complex regulatory and operating environments. As founder, Chairman and Chief Executive Officer of Stratos Global Corporation until 1999, he built the company from its start-up to a successful public corporation. Mr. Rowe was named Chairman of FPI Limited, a world leader in the seafood industry, in 2001, and served as Chief Executive Officer from 2002 through 2005. He is active in technology investments through his investment company Name 3 Capital and is currently Chairman of the Board of Marport Deep Sea Technologies Inc. Mr. Rowe has served on a number of economic and social organizations, including: Canadian Commissioner of the Northwest Atlantic Fisheries Organization (NAFO), on the Advisory Panel on the Sustainable Management of Straddling Fish Stocks in the Northwest Atlantic, the Information Highway Advisory Council, the International Trade Advisory Committee, and with Canada's Communication Research Centre. In Newfoundland and Labrador, Mr. Rowe was appointed to the Premier's Advisory Council on the Economy and Technology, and served as a director of the Health Care Corporation. In the business community, Mr. Rowe has been honoured with significant recognition for his leadership, including Canada's original "Top 40 Under 40" by the Globe and Mail's Report on Business Magazine, with the Ernst & Young regional awards' "Entrepreneur of the Year," and with a Newfoundland and Labrador Export

Award. Mr. Rowe and his family reside in St. John's.

Michael Scott
Chairman & CEO, Precision BioLogic

Michael Scott has worked in developing companies in Canada and the US for almost 30 years. He is Chairman and CEO of Precision BioLogic, a dynamic Halifax firm employing 50 people that develops, manufactures and markets blood diagnostic products used by leading medical institutions across North America and Europe. In 2008, Precision BioLogic was recognized by The Globe and Mail as one of the 50 Best Workplaces in Canada. A two-time Export Award winner, Precision BioLogic has been serving customers internationally for over 14 years. Its key US business has grown at a compound rate of 30% a year since 1994. In 2005, Michael was a finalist in the Ernst & Young Entrepreneur of the Year Awards for Atlantic Canada. Michael is a principal in DRM Equities Limited, a firm providing investment capital and management support to young companies. He was a founder and CEO of Silvagen, a Canadian biotechnology company that commercialized its technology in Vancouver; a director and CFO of Clonetics, a US biotechnology firm that was successfully acquired; and VP of a US-based specialty manufacturer owned by SG Warburg, a British investment bank. Michael was born and educated in England.